JANUARY 21, 1939

THE LANCET

Offices : 7, ADAM STREET, ADELPHI, W.C.2.

Telegrams : LANCET, RAND, LONDON. Telephone : TEMPLE BAR 7228 and 7229.

No. III., OF VOL. I., 1939. LONDON, SATURDAY, JANUARY 21, 1939. Pp. 120—Price 1s.
No. 6021. VOL. CCXXXVI. Founded 1823. PUBLISHED WEEKLY. Registered as a Newspaper. Annual Subscription : Inland £2 2s. Abroad £2 10s.

OXFORD MEDICAL PUBLICATIONS.

SEE PAGE 5.

OBESITY.
A PRACTICAL HANDBOOK FOR PHYSICIANS.
By W. F. CHRISTIE, M.D.
Demy 8vo. Illustrated. 12s. 6d. net.

IDEAL WEIGHT.
A PRACTICAL HANDBOOK FOR PATIENTS.
By the same Author.
Crown 8vo. 5s. net.
William Heinemann (Medical Books), Ltd., London, W.C.1.

SECOND EDITION.
UROLOGY IN WOMEN.
A HANDBOOK OF URINARY DISEASES IN THE FEMALE SEX.
By E. CATHERINE LEWIS, M.S.(Lond.), F.R.C.S. (Eng.), Surgeon to the Royal Free Hospital ; Surgeon and Urologist to the South London Hospital for Women.
¶ "*This book should certainly make and keep for itself a place in urological literature.*"—LANCET.
Pp. viii + 100. With 4 Coloured Plates and 27 other Illustrations. Price 6s. ; postage 5d. ; abroad 9d.
Baillière, Tindall & Cox, 7 & 8, Henrietta-street, London, W.C.2.

9 Plates and 135 Text Illustrations. 15s. net ; postage 6d.
DISEASES OF THE
EAR, THROAT AND NOSE.
By J. DOUGLAS McLAGGAN, F.R.C.S. Eng. and Edin.
London: H. K. Lewis & Co. Ltd., 136 Gower-street, W.C.1.

FRACTURES.
By MEURICE SINCLAIR, C.M.G., M.B., Ch.B. (Edin.).
With an Introduction by Sir ROBERT JONES, Bt., F.R.C.S.
Pp. 550. 337 X ray photographs, photographs and diagrams. 24s. net.
Constable & Co., Ltd., London.

OESOPHAGEAL OBSTRUCTION:
ITS PATHOLOGY, DIAGNOSIS AND TREATMENT (including four chapters on Cancer of the Œsophagus).
By A. LAWRENCE ABEL, M.S. Lond., F.R.C.S. Eng., Senior Assistant Surgeon, Royal Cancer Hospital.
Pp. 245. 132 Illustrations. 2 Col. Plates. 30s. net.
"Masterful and complete. . . . Cannot be too highly praised."
—SURG. GYN. AND OBSTET. JOUR.
Oxford University Press, Amen House, London, E.C.4.

DISEASES OF THE THYROID GLAND
WITH SPECIAL REFERENCE TO THYROTOXICOSIS.
By CECIL A. JOLL, M.S., B.Sc., F.R.C.S. (Eng.).
Crown 4to. Fully illustrated. £3 3s. net.
Revista de Libros : "This book is the best clinical treatise which we possess to-day on the pathology of the thyroid. . . . The excellence of the text is generally enhanced by the illustrations."
William Heinemann (Medical Books) Ltd., 99, Great Russell-street, London, W.C.1.

JOHN BALE MEDICAL PUBLICATIONS
See page 7.
Of interest to both the Practitioner and the Student.

129 Illustrations (10 coloured). 12s. 6d. net ; postage 6d.
DISEASES OF THE TESTICLE.
By HAMILTON BAILEY, F.R.C.S.
". . . one of the best monographs we have read."—*British Journal of Surgery.*
London : H. K. Lewis & Co. Ltd., 136 Gower-street, W.C.1.

Free to the Medical Profession on request. Cloth bound Ed. 5s.
ARTIFICIAL LIMBS.
"SOLVITUR AMBULANDO."
A Symposium on Prosthetic Achievement.
Pp. 72. 37 Coloured Plates.
"I congratulate you on this interesting, instructive, and artistic production. I consider it to be a very great addition to my library."—M.B., Ch.B., F.R.C.S.
J. E. Hanger & Co. Ltd., 7, Roehampton House, Roehampton, S.W.15.

3rd Ed., fully revised, 852 pp., 816 Illustrations.
EMERGENCY SURGERY. 50s. net ; postage 8d.
By HAMILTON BAILEY, F.R.C.S. (Eng.).
Bristol: John Wright & Sons Ltd. London: Simpkin Marshall Ltd.

SECOND EDITION.
DISEASES OF THE RECTUM AND COLON
AND THEIR SURGICAL TREATMENT.
BY
J. P. LOCKHART-MUMMERY
F.R.C.S. ENG., M.A., M.B., B.C. CANTAB.
Emeritus Surgeon to St. Mark's Hospital.
Pp. viii + 616, with 247 Illustrations. Price 35s.
Baillière, Tindall & Cox, 7 & 8, Henrietta-street, London, W.C.2.

Words by ALEX. E. ROCHE, M.A., M.D., M.Ch., F.R.C.S.
UROLOGY IN GENERAL PRACTICE
3 Coloured Plates and 40 Figures. Demy 8vo.
17s. 6d. net ; postage 6d. (*General Practice Series*).
". . . a most attractive and readable book."—B. JNL. OF SURGERY.

PYELOGRAPHY
With an Introduction by SIR JOHN THOMSON-WALKER, F.R.C.S.
With 16 Plates. Demy 8vo. 9s. net ; postage 6d.
" . . . will be of great use . . . of interest and value."—B.M.JNL.
London : H. K. Lewis & Co. Ltd., 136, Gower-street, W.C.1.

PRINCIPLES OF MEDICAL STATISTICS
By A. BRADFORD HILL, D.Sc., Ph.D.
Pp. 172 + viii. 6s. net.
" . . . deserves a wide circulation."—BULLETIN OF HYGIENE.
" . . . short, lucid, and practical."—BRIT. MED. JOUR.
" . . . In less than 200 pages the essentials of statistical method are presented in simple language. . . ."—JOUR. OF THE ROYAL STAT. SOC.
" . . . It is a book that every medical man should absorb."—JOUR. OF AMER. STAT. ASSOC.
The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2.

J. & A. C. ★ *NEW BOOKS* ★ J. & A. C.

A NEW BOOK. Just Published. 60 Illustrations, including 12 Plates. 12s. 6d.
CLINICAL BACTERIOLOGY
By F. A. KNOTT, M.D., M.R.C.P., D.P.H.
Director, Bacteriological Department, and Lecturer in Bacteriology, Guy's Hospital.

A HANDBOOK OF OPHTHALMOLOGY
By HUMPHREY NEAME, F.R.C.S., and F. A. WILLIAMSON-NOBLE, F.R.C.S. *New (3rd) Edition.* 12 Plates, containing 46 Coloured Illustrations, and 143 Text-figures. 13s. 6d.

THE SCIENCE AND ART OF JOINT MANIPULATION
By JAMES MENNELL, M.D., B.C. Vol. I. The Extremities. 284 Illustrations. 18s.

THE MEDICAL DIRECTORY 1939
London, Provinces, Wales, Scotland, Ireland, Abroad, Navy, Army and Air Force.
95*th Annual Issue.* 2460 pp. 61,109 Names. 42s.
This issue contains particulars of at least 30,000 changes.

RECENT ADVANCES IN FORENSIC MEDICINE
By Prof. SYDNEY SMITH, M.D., F.R.C.P., and Prof. JOHN GLAISTER, M.D., J.P. *New (2nd) Edition.* 85 Illustrations. 15s.

J. & A. CHURCHILL Ltd., 104 Gloucester Place, LONDON W.1

LIBRARY OF CONGRESS
FEB 8 1939
MEDICAL DIVISION

For the relief of **ASTHMA**

BRONCHOSPASM must be abolished

Morphia and other narcotics are definitely contra-indicated in all chronic disease . . .

Felsol . . .

relieves bronchospasm immediately yet FELSOL POWDERS contain *no* morphia or other narcotic

For full particulars of the FELSOL TREATMENT of ASTHMA *without narcotics* and a supply of powders for clinical trial write :—

Telephone : Clerkenwell 5862

BRITISH FELSOL COMPANY LTD.
Wigton House, 206/212, St. John Street,
Clerkenwell - - - - - London, E.C.1

Telegrams : Felsol, Smith, London

Valentine's Meat-Juice

For **Quieting** the **Irritable Stomach** in **Pregnancy**, for **Rapidly Restoring** the **Vital Forces** in **Hemorrhage**, for **Sustaining** and **Strengthening** in **Long** and **Exhausting Labor**, **Valentine's Meat Juice** is Extensively employed in

Obstetrical Practice.

Dr. M. DeCristoforis, *Prof. Lecturer on Midwifery and Gynæcology, Milan, Italy :* "The preparation, VALENTINE'S MEAT-JUICE, has been successfully used by me in a serious case of acute puerperal hemorrhage. The patient could take no food or drink. VALENTINE'S MEAT-JUICE was completely retained and restored very promptly the strength and the cardiac impulsion."

For Sale by European and American Chemists and Druggists.

VALENTINE'S MEAT-JUICE COMPANY,
A 21 RICHMOND, VIRGINIA, U.S.A.

JANUARY 21, 1939

THE LANCET

A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, CHEMISTRY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS

No. 6021 LONDON: SATURDAY, JANUARY 21, 1939 CCXXXVI

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ADDRESSES AND ORIGINAL ARTICLES

The Rehabilitation of the Injured Workman. By DONALD STEWART, M.R.C.P. 129
Placental Blood for Transfusion. By J. HOWKINS, F.R.C.S., and H. F. BREWER, M.D. 132
Prophylaxis of Tuberculous Empyema. By L. ROBERTS, M.R.C.P. .. 134
Renal Changes in Malignant Hypertension. By C. WILSON, D.M., and F. B. BYROM, M.R.C.P. (*illus. on plate*) 136
Interruption of Coma in Insulin Shock Therapy. By R. FRASER, M.R.C.P., and D. A. STANLEY, B.Sc. 140
Gastric Secretions during Pathological Hypochlorœmia. By B. M. NICOL, M.B., and A. LYALL, M.R.C.P. (*with charts*) 144
A Surgical Procedure for Ulcerative Colitis. By Hon. J. F. GAHA, M.B. (*with chart*) 146
Miners' Dyspnœa. By J. N. PETERSON, M.D., J. M. PETERSON, D.Sc., and C.W. STARTUP, Ph.D. (*with chart*) 147

CLINICAL AND LABORATORY NOTES

Night-blindness Treated with Vitamin A. By C. VAILLANT, M.R.C.P., and L. GILLIS, M.B. 149
Gas Gangrene. By BETTY WALKER, M.B. 150

REVIEWS AND NOTICES OF BOOKS

The Emotional Factor in Visceral Disease. By H. G. McGregor, M.R.C.P. 150
Whitla's Dictionary of Treatment. By R. S. Allison, M.R.C.P., and C. A. Calvert, F.R.C.S.I. 151
Principles and Practice of Obstetrics. By Prof. J. B. DeLee, M.D. 151
Statistical Methods for Research Workers. By Prof. R. A. Fisher, F.R.S. 151
1938 Year Book of Radiology. Edited by C. A. Waters, M.D., and Ira I. Kaplan, M.D. 151
A Treatise on Hygiene and Public Health. By B. N. Ghosh, F.R.F.P.S.G. 152
Tuberculose et tuberculides nasales. By Profs. J. Margarot and J. Terracol .. 152
Clinical Examination of the Nervous System. By Prof. G. H. Monrad-Krohn, F.R.C.P. 152
Dental Anatomy and Physiology and Dental Histology. By T. W. Widdowson, L.D.S. 152

LEADING ARTICLES

MALIGNANT HYPERTENSION 153
SURGERY IN ULCERATIVE COLITIS 154
PSYCHOTHERAPY BY LAYMEN 154
CHANGES IN THE POISONS RULES 155

ANNOTATIONS

Cigarette-smoking 156
The Placenta and Toxæmia 156
Treatment of Asthma..... 156
Hæmoglobin Katabolism . 157
A Hundred Years 157
Sympathectomy for Skin Disease 158
Celsus de Medicina 158
Significance of Pain in Cardiac Infarction..... 158
The G.M.C. Under Fire... 159
The Ætiology of Prostatic Adenomata..... 159
Spain 160

THE AIR-RAID

III—General Principles of Wound Surgery and Anæsthetics. P. H. MITCHINER, F.R.C.S., and E. M. COWELL, F.R.C.S. 171

GRAINS AND SCRUPLES

From a Physiologist in America—III 173

SPECIAL ARTICLES

Epidemic Jaundice: A Hospital Outbreak. By E. M. MARTLAND, M.B., and A. L. WINNER, M.R.C.P. (*with chart*) ... 161
National Council for Mental Hygiene: Outpatient Mental-treatment Clinics —Mental Hygiene and the Press..... 163
Medicine and the Law: Bogus Doctor—Consent to Dental Extraction—Fee for Emergency Treatment 167
First-aid Posts and Hospitals in Air Attack.... 168
Scotland: Aberdeen University—Edinburgh Royal Infirmary 169
United States of America: The Hourly Distribution of Stillbirths and Neonatal Deaths (*illus.*).... 169
Paris: Expansion of the Pasteur Institute—Institutional Care of the Insane Foreigner 170

THE LANCET 100 Years Ago 168

THE LANCET Index, Vol. II, 1938..... 168

PANEL AND CONTRACT PRACTICE

Relation between Doctor and Patient 175

PUBLIC HEALTH

Pneumonia and Influenza —The Incidence of Poliomyelitis—London's Underground Watersupply 176
Infectious Disease in England and Wales 177

OBITUARY

James Rutherford Morison, F.R.C.S. (*with portrait*).. 178
The late Prof. Wingate Todd 179
Charles Edward Alexander MacLeod, F.R.C.S..... 180

LETTERS TO THE EDITOR

A New Remedy for Epilepsy (Dr. R. Coope).... 180
Whither the Almoner? (Mr. E. Rock Carling, F.R.C.S., Dr. R. D. Lawrence)..... 181
Oily Suspensions of Sulphanilamide Compounds (Dr. L. E. H. Whitby) .. 181
Prophylaxis with Sulphanilamide (Dr. Reginald Lightwood)..... 182
Fracture of the Patella (Mr. G. O. Tippett, F.R.C.S.) 182
Lord Horder and the *Daily Mail* (Mr. Stanley Bell) . 182

MEDICAL NEWS

Royal College of Surgeons of England 183
University of Glasgow 183
Harveian Society of London 183
Refugee Nurses 183
Child Guidance Conference 183
King's College Hospital, London 183
Ophthalmic Exhibition ... 183
International Cancer Congress 183
Society of Radiotherapists of Great Britain and Ireland 183
Order of the Nile..... 183
Award of Pavlov Prize.... 183
Cod-liver Oil for Spain.... 183
Hospital Amalgamation at Sheffield 183

NOTES, COMMENTS, AND ABSTRACTS

Principles of Medical Research: The Limitations of Histology. By LORENZ S. MICHAELIS, M.D. 186
Drink 187
The Grading of Nurses ... 188
The Drug Call 188
Mental Disease Explained. 188
Folk-lore and Medicine.... 160
The Special Areas 185

Medical Diary 184
Vacancies 184
Births, Marriages, Deaths . 185
Appointments 185

JUST PUBLISHED

A CEREBRAL ATLAS

Illustrating THE DIFFERENCES BETWEEN THE BRAINS OF MENTALLY DEFECTIVE AND NORMAL INDIVIDUALS, with A SOCIAL, MENTAL, AND NEUROLOGICAL RECORD OF 120 DEFECTIVES DURING LIFE

By RICHARD J. A. BERRY, M.D., F.R.S.E., F.R.C.S.E.

Director of Medical Services to the Incorporation of National Institutions for Persons requiring Care and Control

Size 18″×15″. 426 pages, with 404 full-size photographs of normal and defective brains, 27 microphotographs, and 10 text-figures **£5 . 5 . 0** net

OXFORD UNIVERSITY PRESS

Just Published

INTRODUCTION TO
DISEASES OF THE CHEST

By

JAMES MAXWELL, M.D. (Lond.), F.R.C.P. (Lond.)

Assistant Physician and Demonstrator of Practical Medicine, St. Bartholomew's Hospital; Physician, Royal Chest Hospital; Consulting Physician, Royal National Sanatorium, Bournemouth

CONTENTS

SECTION I
THE HISTORY

CHAP.
1. THE SIX MAJOR SYMPTOMS
2. THE SIX MAJOR SYMPTOMS (*contd.*)
3. MINOR SYMPTOMS
4. THE AUXILIARY HISTORY

SECTION II
PHYSICAL EXAMINATION OF THE CHEST

5. INSPECTION
6. PALPATION
7. PERCUSSION
8. AUSCULTATION

SECTION III
SPECIAL INVESTIGATIONS

9. THE SPUTUM
10. BLOOD EXAMINATIONS—PLEURAL FLUID
11. RADIOLOGY OF THE CHEST
12. SPECIAL DIAGNOSTIC METHODS

SECTION IV
DISEASES OF THE RESPIRATORY TRACT

13. THE NOSE
14. THE MOUTH
15. THE LARYNX
16. THE TRACHEA AND BRONCHI

SECTION IV
(*continued*)

CHAP.
17. ASTHMA
18. BRONCHIECTASIS
19. TUMOURS OF THE BRONCHI
20. CHEST INJURIES — DISORDERS OF THE PULMONARY CIRCULATION
21. EMPHYSEMA
22. COLLAPSE OF THE LUNG
23. PNEUMONIA
24. BRONCHO-PNEUMONIA
25. PNEUMONITIS
26. LUNG ABSCESS
27. PULMONARY TUBERCULOSIS
28. PULMONARY TUBERCULOSIS (*contd.*)
29. TREATMENT OF PULMONARY TUBERCULOSIS
30. NON-TUBERCULOUS CHRONIC LUNG INFECTIONS
31. FIBROSIS OF THE LUNG
32. THE PLEURA
33. "PLEURISY"
34. EMPYEMA
35. TUMOURS OF THE PLEURA
36. THE MEDIASTINUM
37. THE DIAPHRAGM

INDEX

With 95 Illustrations

Demy 8vo, 328+xii Pages **12/6 net (postage 6d. extra)**

HODDER & STOUGHTON Medical Publications

Warwick Square, London, E.C.4

ADDRESSES AND ORIGINAL ARTICLES

THE REHABILITATION OF THE INJURED WORKMAN*

WITH SPECIAL REFERENCE TO THE WORKMEN'S COMPENSATION ACT

BY DONALD STEWART, M.D. Edin., M.R.C.P.E.

MEDICAL OFFICER, I.C.I. METALS, LIMITED; HONORARY SECRETARY, ASSOCIATION OF INDUSTRIAL MEDICAL OFFICERS

"It has been generally recognised that there is a strong case for review of various provisions of the existing (Workmen's Compensation) Acts in the light of modern ideas and conditions."

THIS statement prefaced the Prime Minister's announcement in June, 1938, that a royal commission was to be set up by the Government to inquire generally into the working of the present system of workmen's compensation in the light of modern conditions and knowledge. Workmen's compensation law has given rise to much controversy throughout the country within recent years. The House of Commons frequently has before it private members' bills advocating some alteration in the present laws, and two separate government committees have been set up to investigate points in connexion with the working of the Act; a departmental committee on "certain questions arising under the Workmen's Compensation Act," set up in 1935, published its report in January, 1938, and the interdepartmental committee "on the rehabilitation of persons injured by accidents," which was formed in April, 1936, published an interim report in May, 1937, and its final report is expected during 1939. And, as already stated, a royal commission has now been appointed, the terms of reference of which have recently been announced by the Prime Minister.

The question of monetary compensation for industrial injuries is one of complexity not only on the administrative and legal side but also from the medical point of view. The present laws have a definite bearing on the clinical course of many compensation cases, on their duration, on the degree of incapacity, and on their eventual recovery. (It has to be remembered that the Workmen's Compensation Act applies to certain occupational diseases also "as if the diseases were a personal injury by accident," but this paper is limited to the Act as it affects injury in the surgical sense.) In many cases recovery and rehabilitation are definitely retarded as a result of the present laws, and in relation to that contention the following paragraph, taken from the report of the B.M.A. committee on fractures (1935), is perhaps of interest: "The Workmen's Compensation Acts, although designed to protect the workman, have in many cases played a powerful part in prolonging his disability, in delaying his return to work, and, on occasions, in converting him into a permanent invalid."

Within recent times there has been criticism of the part played by the medical profession in this matter. Such criticisms may be true in certain instances, particularly with regard to the lack of organised treatment of fractures and other industrial injuries. It is not my intention however to discuss treatment on this occasion, but to show, from personal experience, that much of the doctor's work today which has to do with the rehabilitation of the injured workman is being actively antagonised by the present legislation in this country.

* Read in opening a discussion at a meeting of the Institute of Labour Management, London, Nov. 8, 1938.

INCIDENCE OF COMPENSABLE INDUSTRIAL INJURIES

The aggregate number of persons coming within the provisions of the Acts who were employed in the seven great groups of industries (mines, quarries, railways, factories, docks, construction, and shipping) in which returns are called for from employers by the Government was 7,606,066 in 1936, and of these 461,557 were compensation cases. During 1937 the number of compensable factory accidents reported to the Home Office was 193,542, of which 903 occurred in a group of some 12,000 workers in the midlands under my medical care. (A reportable accident is one "which is either fatal or disables the workman for more than three days from earning full wages for the work at which he was employed.") Careful observation was made of all these cases and, during the year, 3868 separate examinations for compensation purposes were carried out by the medical staff. This work has a significant bearing on the rehabilitation of injured employees. By keeping a close watch on progress the industrial doctor is able to regulate the return to work, and because of his intimate knowledge of the man's job and of his financial affairs, and by continued contact with the man himself, this part of industrial medicine becomes a link in the chain of rehabilitation the significance of which is now becoming more fully realised in the country.

COST OF COMPENSATION

During 1936 the total amount of compensation paid in the seven great groups of industries already referred to was £6,447,937.† This figure represents only the amount paid to workmen or their dependants and is not the total charge on these industries in respect of compensation. An additional charge—e.g., administrative expenses and medical and legal costs—brings the figure, according to the statistical branch of the Home Office, to about £8,000,000. It is estimated by the Home Office also that the total charge to all industries and employments under the Act—i.e., including industries outside the seven groups—is something approaching £12,500,000. Finally, the total cost of an accident is considerably greater than the sum paid in compensation and these charges just mentioned. For instance, there is the cost of time lost by injured employees paid for by the employer and of time lost by other employees and works management at the time of accident or subsequently arising out of the accident, interference with production, payments from benevolent and friendly societies, and "light work" and "alternative work" schemes. These are non-insurable losses and, when added to the figures already mentioned, must of necessity bring the gross cost to industry in Great Britain to a much greater figure. American investigations suggest that such losses are in the ratio of 4 to 1, in relation to the direct costs. Even if a more conservative estimate of 2 to 1 were taken, the gross cost to industry would still be in the region of £40,000,000, and, if the cost of the social effects could be computed, such as the loss of wages, the decrease in spending power, and the effect on trade generally, the total figure must come to an immense sum annually.

CLAIM FOR COMPENSATION

Under section 15 (1) of the Act the employer has to post up "in some conspicuous place at or near

† Workmen's Compensation, Statistics of Compensation and Proceedings for 1936. 1938. London.

every mine, quarry, or factory, where it may be conveniently read by the persons employed, a summary of the requirements of the Act, with regard to the giving of notice of accidents and the making of claims. . . ." In my experience the workman rarely if ever reads this, or, if he does read, does not fully understand what he has to do. Often, too, the notice may be in a place to which the workman rarely goes. And so it happens that some of us may have to advise an employee how to proceed with a claim for compensation after an injury, and medical practitioners, especially in industrial areas, may also be asked for advice. The following points which have proved of practical value in a large factory in the midlands may therefore be helpful and can readily be told to the workman by his medical attendant or can be issued by the employer in the form of a pamphlet:

TO THE WORKER

HOW TO PROCEED IN THE EVENT OF AN ACCIDENT AT WORK

Should you at any time meet with an accident in the course of your employment you should carefully follow these directions:—

(1) However slight the injury you must report immediately to your ambulance room (or first-aid attendant if there is no ambulance room).

(2) As soon as you return to your department from the ambulance room (or attendant) you should report the accident to your foreman, and you should also enter full particulars (or ask a fellow worker to do so on your behalf) in the accident book which has to be provided by your employer under law.

(3) If as a result of your injury you are sent home, to hospital, or to your panel doctor (without returning to your department), the nurse or first-aid attendant will notify the foreman on your behalf, and in that case it is not necessary to enter particulars in the accident book.

HOW TO OBTAIN COMPENSATION UNDER THE WORKMEN'S COMPENSATION ACT

Compensation is payable when you suffer loss of earnings as a result of personal injury by accident arising out of and in the course of employment. Follow this procedure:—

(1) Obtain a doctor's certificate and send it to the works with your full name, department, clock number, date and time of accident, and when and to whom reported. If you have not previously reported the accident, give these particulars when you send the doctor's note.

(2) Your employer, or the insurance officer acting for him, may have to obtain further details of the occurrence from you and may require you to be examined by a medical practitioner chosen by him. In your own interest you should do all in your power to assist in every way. Doctors' fees in this respect will be paid by your employer or the insurance officer.

(3) When it is established that your incapacity is in accordance with law, arrangements will be made for payment of compensation. Legally, no compensation is payable for the first three days of disablement unless the disablement lasts for four weeks or more.

(4) If you have any doubt whatever whether your absence from work is due to an "accident" covered by the Act, you should obtain from your panel doctor a national health insurance certificate for submission to your approved society; otherwise you may lose health insurance benefit should it later be established that you have no claim under the Workmen's Compensation Act. It will then be the duty of your approved society to approach your employer or the insurance officer, should they consider it a case for compensation rather than sickness benefit.

(5) In disputed cases your approved society will, if its rules so provide, make you an advance of benefit until a decision has been reached as to whether the absence does or does not entitle you to compensation. If the rules of your approved society do not provide for such an advance of benefit, they may still agree to make you the advance and notify your employer, and in the event of your being entitled to compensation the total amount so advanced will be repaid by your employer to your approved society from the compensation money.

COMPENSATION PAYMENTS

Compensation payments start as from the fourth day of the accident, but if the injured man is off work for four weeks or more he receives payment for the first three days. Some firms realise the possible hardship to a man as a result of this and pay compensation from the day of the injury. My own firm does this but reserves the right to withhold payment in cases where they consider that the man has been at fault—for example, in not reporting a finger injury until it is septic.

The maximal payment to the injured workman is 30*s.* a week. It may be paid until the employee is ready for some form of work, and then the law states that this amount may be reduced because of the fact that he may not be totally incapacitated. The amount of compensation is assessed on the man's average weekly earnings—the maximum of 30*s.* being given only if the man has been earning a wage of £3 a week or over. If the wage has been less than that, his compensation is assessed on a sliding scale; for example, a man earning 50*s.* a week will receive 25*s.* in compensation, and so on. If a man who has earned 50*s.* a week returns to work at a wage, say, of 42*s.* 6*d.* per week, half the loss of earnings—i.e., half of 7*s.* 6*d.*—is paid to him under the Act. If that payment is likely to be permanent it is usually compounded as a lump-sum settlement which cannot be paid except by the assent of the county court, where the judge is the assessor as to its sufficiency. Lump sums are paid into court and kept there until the person is 21 years of age, up to which time the worker receives 5 per cent. interest on his money. Thereafter the sum is handed over to the worker, who has the complete right of disposal.

SOME EFFECTS OF THE PRESENT LAWS

The amount of weekly payment.—We have seen that the maximal amount which a worker can receive as compensation as a result of an injury is 30*s.* per week. If the worker belongs to sick clubs or friendly societies to which he has contributed he may pick up another 10*s.* to 15*s.* per week, but only for a limited period. For example, in I.C.I. all employees contribute to a workers' friendly society at the rate of 4*d.* a week and receive, when away from work through sickness or injury, 10*s.* a week for thirteen weeks. After that time has elapsed half benefit is granted—i.e., 5*s.* a week—which is payable for a further period of thirteen weeks.

Many workers in this country receive a wage greater than £3 a week, and when they meet with an accident at work have to be content with a reduction in income. In such cases the income is often inadequate to support a sick man and his dependants. Feeding costs are not necessarily reduced by incapacity, and actually may be increased, while at the same time the man has less money with which to purchase food. The inadequacy of income may hasten the man's return to work and may do him harm, and in other cases it may delay his return.

Further economic difficulties and home troubles will certainly arise. The universal use of hire-purchase systems may mean difficulty in finding weekly payments; children have to be clothed; the

wife has to be given money to maintain the household; rents have to be paid; and there may be considerable travelling expenses to hospital. Savings are quickly used up, and in some cases, because of the sudden change in method and habit of living, physical, mental, and moral degeneracy may ensue. Men are more seriously affected than women in most cases because of their higher average earnings. Generally speaking, when a man is off work as a result of injury his whole status is altered, and, the cost-of-living index having increased during recent years and the purchasing power today being less than it was, the amount of money that a man can bring into the home becomes a matter of prime importance.

The remedy for this state of affairs, which is so intimately bound up with the man's power of recovery, must be by some reassessment of the amount of weekly compensation payment. To be effective the assessment should bear a closer relationship to the man's economic and home life than it has hitherto. For example, the number of children under the age of 14 which he has to maintain is an important point. The term "compensation" at this stage of the man's absence is really a misnomer. Weekly payments should rather be considered as "allowances for maintenance" or even "allowances for treatment." Public opinion agrees that this is one of the outstanding deficiencies of the present Act, and from the medical point of view its importance cannot be over-emphasised.

Delay in payment.—In some cases there may be hardship to the injured workman where there is doubt as to whether his disablement is due to non-occupational reasons or has arisen out of his employment. No difficulty arises in cases where the employer accepts liability, but if he does not do so, and if the approved society also refuses benefit, the man may find himself suddenly without income for several weeks, pending the settlement of his case. Most of the large approved societies pay when their members ask for an advance, but in my experience a number of cases of hardship have arisen; as a result of the delay men become quickly antagonistic to everything, including treatment, and rapidly become difficult to handle and unreceptive to medical advice. The report of the committee on "certain questions arising under the Workmen's Compensation Act" has considered this problem in detail and has recommended that it should be the duty of approved societies to make advances of sickness benefit to workmen pending a decision on the claim for compensation under the Act. If this recommendation is made law, one obvious deficiency will be rectified.

Lump-sum settlements.—The practice of lump sums being handed over to workmen in compensation for disablement appears to be popular in this country. From a medical point of view, however, the question raises many difficulties and often is the direct cause of major psychological disturbances. The granting of such sums may be preceded by extended litigation. When this takes place the patient's attention is given up to the immediate issue—i.e., obtaining large sums of money—and the fact that there is a necessity for him to recover is relegated to the background. The thought of disability becomes fixed in his mind, and he feels that he cannot afford to get well. In workmen who may have neurotic tendencies the idea of litigation produces a well-marked psychoneurosis.

In some cases lump-sum payments have the effect of producing rapid cure, specially with minor injuries. The psychological sequelæ are thereby placed in their proper perspective with a clinical improvement. In other cases the holding up of lump-sum settlement produces a mental imbalance; but, once payment is made, the patient's imaginary troubles are transferred to some other sphere, and recovery is rapid. A similar state of affairs occurs when the patient may be forced into litigation on the advice of his lawyer, of his trade-union official, or even of his friends and relations. Once the anxiety of litigation is removed, cure is no longer delayed.

In my experience lump sums are often mismanaged by those who receive them, although this is not necessarily the experience of others. Small businesses are bought in the hope of good profits. Lack of ability may quickly convert the outlay into complete loss. Women often purchase expensive articles to which their imagination may have been attracted for years previously—e.g., fur coats and wireless sets—and men become all too keen on a flutter. This misuse of lump sums appears to apply mainly to young persons and to those who are emotionally unstable. The idea of suddenly acquiring a comparatively large sum of money fascinates to a degree, and judgment becomes warped. On the other hand, one often feels strongly in sympathy with them; under the same circumstances which of us would not feel tempted likewise? In many cases where a lump sum has been badly expended and wasted, and the degree of incapacity has been such that the man is unfit to earn a living wage, he eventually becomes relegated to the industrial scrap-heap and, along with the unemployable, presents the country with an acute social problem.

This problem, in so far as injuries are concerned, can be solved primarily by reducing the number of cases who have permanent disability. The medical profession and hospital authorities generally have much to learn from clinics such as that of Böhler in Vienna, where a reduction of over 30 per cent. is claimed to have been effected in such cases. In short, when we consider the facts in their true perspective, medicine of today is surely presented with a great incentive towards further efforts in this direction.

Lack of travelling allowances to and from treatment centres.—No allowances are given for travelling to and from hospital for treatment. In many cases this is a hardship. A man may have to attend at hospital every day for long periods, being forced to spend several shillings a week in fares. The only payment of this kind allowed for under the Act is the cost of travelling to a medical referee appointed by the insurance company. Some insurance companies, however, take the matter into consideration when the final lump-sum assessment is made, but this is unsatisfactory. The remedy is simple. Reasonable allowances, not necessarily paid in cash (because the possibility of abuse is self-evident), should be made to the patient from the beginning in such cases; the result from the medical point of view alone would well justify some alteration in the Act and do much to relieve a petty worry with which I have often had to deal.

Lack of provision of special apparatus, such as artificial limbs.—Compensation payment does not cover the cost of special apparatus required by the patient for his complete rehabilitation—e.g., artificial limbs, teeth, or eyes; wigs; and glasses—but many employers provide these extras through their insurance companies, and my own company gives its medical officers a free hand in this matter. In the case of teeth and glasses benefit can often be obtained through approved societies, covering a part of the payment necessary.

In the case of a workman who has lost a leg rehabilitation cannot be complete until he obtains a well-fitting artificial limb. Further, he has to be exercised and educated in its use. But just at the time when a limb is necessary he may be in the middle of litigation and is completely unable to afford this costly piece of apparatus. From the medical point of view there is no doubt that great benefit would be derived on all sides if the cost of such apparatus could be met in every case by insurance companies, at a time and of a type to be decided by medical opinion.

Injuries due to larking.—Compensation is not available for the workman who is injured in the course of his occupation by another employee or person inside the factory who is larking or playing the fool. The injured man can sue the aggressor in common law but not the company. Needless to say, such action could be of little benefit to the man. The difficulties of changing legislation on this point are no doubt many, but nevertheless men have to suffer needlessly today because of the law, and from the purely medical point of view treatment is often made extremely difficult. It is felt that the subject needs full investigation.

INSURANCE COMPANIES AND COMPENSATION PAYMENTS

In discussing the relationship between compensation and rehabilitation some brief mention must be made of the fact that insurance companies play a most important part in the scheme of things. Because of the custom of insuring against risk in almost all branches of life it is natural that this should frequently be done by employers in connexion with their liability under the compensation laws. (Imperial Chemical Industries, as do many other organisations in the country, carries its own insurance; and other firms insure through mutual indemnity associations. This paragraph does not refer to either method of insurance and compensation payments.) The procedure immediately raises an issue with regard to compensation payments which has an intimate bearing on the problem.

There is a feeling that the manner in which payments are made to injured workmen is frequently open to serious criticism, and that some of the present methods of insurance should be revised. No doubt the subject will be discussed in full by the interdepartmental committee whose report is awaited with interest and by the royal commission. Indeed, to avoid full investigation into the matter would be to evade one of the main issues and so reduce the value of other recommendations. The problem is primarily non-medical, but the direct effects on the patient and therefore on his relationship with the doctor are of undoubted importance to modern medicine.

Forcible statements on this question have been made by a number of authorities. In discussing the subject of industrial health the P E P report on the British Health Services, perhaps one of the most penetrating publications of our time, makes this statement: "Some of the methods insurance companies employ to induce injured men to take lump-sum payments, which are often cheaper to the company than annuities, are very questionable." And the B.M.A. committee on fractures reported that: "It is to be inferred that measures, such as here proposed, which will very materially reduce the total incapacity periods of the insured, will not necessarily be welcomed (by insurance companies), since that must involve a reduction of revenue through the lowering of premium."

GENERAL CONSIDERATIONS

Under present conditions the laws relating to workmen's compensation are not only often a hardship to the workman but also seriously handicap the doctor who is trying to do his best for the patient. Because of this fact the time has come for the medical profession to make a strong protest against such a state of affairs.

The present Act deals with compensation, but little is said about treatment. There is no onus on the injured man to provide himself with suitable treatment, and no suggestion that a good recovery is essential, even on purely economic grounds. Is there not a prima-facie case now for action? Have we forgotten the lessons of the late war and the work of the Ministry of Pensions, when treatment was all-important and was carried out by doctors of the highest skill, when a man could not refuse treatment or discontinue it without losing benefit and allowances, and when occupational training and rehabilitation, in a sense of the term not known today, were freely provided.

Rehabilitation, so much discussed at present, is a matter not by any means only for medical skill and knowledge. To be effective it must cater for the patient, both as a worker in industry and also as an individual member of a community and head of a home. The medical profession will do its best—of that there is no doubt—when the proper lead is given, but any alterations and improvements in the present methods of treatment and rehabilitation which may take place in the near future must of necessity be accompanied by fundamental alterations in the laws of the land.

PLACENTAL BLOOD FOR TRANSFUSION

By John Howkins, M.D., M.S. Lond., F.R.C.S.
RESIDENT PHYSICIAN-ACCOUCHEUR TO ST. BARTHOLOMEW'S HOSPITAL, LONDON; AND
H. F. Brewer, M.A., M.D. Camb.
CLINICAL PATHOLOGIST TO THE HOSPITAL

Blood for transfusion is likely to enjoy a boom, in which all sources of this valuable commodity will merit careful investigation. It is therefore opportune that there have recently appeared a number of communications on the possibilities of using placental blood for transfusion, and these must have aroused the curiosity of all interested in this work.

Neglecting for the moment the alleged advantages of placental blood, qua blood, such as increased erythrocyte and hæmoglobin content, absence of allergens and agglutinins, and enhanced hæmostatic powers, we have confined the issue by which this new source of supply is to be assessed to three essential questions of practical importance. The first of these is the *quantity*, which must be of such average proportion as to justify the trouble of collection, otherwise the source is uneconomical. The second is the *sterility* of the collected samples, when an ordinary aseptic routine is used against genital, air-borne, and droplet infection; a high percentage of contaminations immediately vitiates the whole method. Thirdly, it must be feasible to entrust the *collection* of the blood to the ordinary personnel of a hospital obstetric unit.

Goodall, Anderson, Altimas, and MacPhail (1938) described in some detail their methods of collection and preservation of placental blood, for which they used a formula later referred to in this article. Their average yield was 125 c.cm. and with regard to the

question of sterility they made the following observation: "cultures of the preserved blood are unnecessary because, at the low temperature for preservation, contamination, if present, could not propagate, and consequently would be so attenuated as to be innocuous." To both these points we refer later. These workers claim, moreover, that "in the many transfusions with fœtal blood there has not been one untoward reaction."

Grodberg and Carey (1938) in a similar investigation claimed an average yield of 105 c.cm.; they did not, however, use the same anticoagulant as Goodall and his colleagues, but substituted 15 c.cm. of a 2·5 per cent. sodium citrate solution, which is in close agreement with our own optimum solution, although they mention that they did in a few cases employ Goodall's formula, without stating what, if any, reactions they obtained from this. In this series 46 patients were transfused with a reaction ratio of 1 in 20. To test the sterility of the 235 samples collected Grodberg and Carey selected 26 and cultured these aerobically and anaerobically. Their vintage varied from 1 to 36 days and the cultures were uniformly sterile. The onus of collection was, presumably, in the hands of interns, as the operators are referred to as male. To all these points we shall severally refer later.

TECHNIQUE OF COLLECTION AND STORAGE

All infected and potentially infected cases, and all cases in which the baby is asphyxiated, must be excluded, and only normal clean deliveries used. As soon as the baby is born the cord is clamped with artery forceps in two places and divided. The operator responsible for the collection of the placental blood, after carefully swabbing the cord with surgical spirit or iodine, discards his or her dirty gloves and puts on a clean pair. The cord is compressed between the finger and thumb and the distal six inches, with the clamp attached, severed; the end of the cord is now inserted through a small hole in a sterile towel and allowed to drain, via a funnel, into a sterile container, into which has been poured the anticoagulant fluid. The purpose of the towel is to exclude air-borne and droplet infection and to prevent any fluid, contaminated from the genital tract and perineum, from seeping down the cord and into the container. After massaging the fundus and milking the cord to ensure the maximum possible yield, the container is sealed and placed, duly labelled with the date of collection, in a refrigerator at 38° F. A small test-tube is filled with enough blood to group the sample and affixed to the main container.

The actual container used by us for storing the blood was a rubber-stoppered milk bottle and a number of these were kept ready sterilised in a special drum in the labour theatre. The anticoagulant that we employed was 0·3 g. of sodium citrate in 10 c.cm. of sterile water and this was prepared specially for us in ready sealed ampoules by British Drug Houses Ltd., whom we wish to thank for their helpful coöperation. Before deciding on this anticoagulant, we experimented with one recommended by Goodall, Anderson, Altimas, and MacPhail (1938), according to their formula, which is taken from the Moscow Institute of Hæmatology. This consisted of the following ingredients:—

Sodium chloride	7·0 g.
Sodium citrate	5·0 g.
Potassium chloride	0·2 g.
Magnesium sulphate	0·004 g.
Twice-distilled water ..	1000 c.cm.

"This solution is now put up in ampoules of 25 c.c. which, when added to 100 c.c. of distilled water, gives one the proper dilution, so that preservative and blood from each case is mixed in equal proportions, 125 c.c. of preservative and roughly 125 c.c. of blood." The result of using this solution was unsuccessful; not only did the blood clot in each case, but hæmolysis occurred in addition. These phenomena we attributed to the hypotonicity of the solution and the fact that the minimum requirement of citrate concentration percentage was not fulfilled. This percentage is generally recognised to be in the region of 0·3 g. sodium citrate to every 100 c.cm. of blood.

INVESTIGATION OF MATERIAL

Placental blood was collected as described from 50 cases, immediately after the delivery of the child, and stored in a refrigerator at 38° F. The average yield obtained was 47 c.cm. and the maximum 90 c.cm.

The sterility of the various samples was investigated at periods varying from six to fifteen days, employing the following technique. After gentle agitation to mix the blood uniformly in the bottle, 1 c.cm. was transferred to both peptone broth and cooked-meat medium. The former was incubated aerobically and the latter anaerobically in a McIntosh and Fildes jar and observations made up to a period of one week. The results of these primary cultures of the individual samples revealed that 22 per cent. were contaminated. The infecting organisms were for the most part saprophytes and comprised *Bacillus subtilis* group (12 per cent.), coliform bacilli (6 per cent.), white staphylococci (2 per cent.), and *B. pyocyaneus* (2 per cent.) These represent air-borne, skin, or genital-tract contamination.

Repeat cultures (aerobic and anaerobic) were made on the samples of blood after intervals of a further two to four weeks' cold storage; with the exception of one sample, when an organism of the *B. subtilis* group was obtained on the second culture only, the results were identical with the primary cultures.

DISCUSSION

The average quantity of placental blood collected from our 50 cases is small—i.e., 47 c.cm. which compares unfavourably with Goodall's and Grodberg's figures of 125 and 105 c.cm. respectively. In explanation of our modest average volume it should be emphasised that the samples were obtained from fifty consecutive placentæ, at term, without selection of the larger or rejection of the smaller samples. This small yield would necessitate the mixture of 10–12 samples to supply the bulk of blood usually employed in an adult transfusion; and it is questionable if this extensive pooling of several bloods, although of the same group, is entirely devoid of the risk of minor subgroup reactions of agglutination.

With regard to sterility, the result of our investigation showed that 22 per cent. of the samples were contaminated with air-borne or genital tract organisms. We can neither agree with Goodall in his assertion that culture of the collected blood is unnecessary, nor with Grodberg in his statement that any stray organisms present are usually killed by the leucocytes—a statement that we have proved to be incorrect, in that our second culture always tallied with our first, and organisms if present on the seventh day always survived up to the time of subsequent culture. We would hesitate to sponsor the lighthearted intravenous infusion of a thriving colony of *B. subtilis*, let alone one of *B. pyocyaneus*.

In the case of a workman who has lost a leg rehabilitation cannot be complete until he obtains a well-fitting artificial limb. Further, he has to be exercised and educated in its use. But just at the time when a limb is necessary he may be in the middle of litigation and is completely unable to afford this costly piece of apparatus. From the medical point of view there is no doubt that great benefit would be derived on all sides if the cost of such apparatus could be met in every case by insurance companies, at a time and of a type to be decided by medical opinion.

Injuries due to larking.—Compensation is not available for the workman who is injured in the course of his occupation by another employee or person inside the factory who is larking or playing the fool. The injured man can sue the aggressor in common law but not the company. Needless to say, such action could be of little benefit to the man. The difficulties of changing legislation on this point are no doubt many, but nevertheless men have to suffer needlessly today because of the law, and from the purely medical point of view treatment is often made extremely difficult. It is felt that the subject needs full investigation.

INSURANCE COMPANIES AND COMPENSATION PAYMENTS

In discussing the relationship between compensation and rehabilitation some brief mention must be made of the fact that insurance companies play a most important part in the scheme of things. Because of the custom of insuring against risk in almost all branches of life it is natural that this should frequently be done by employers in connexion with their liability under the compensation laws. (Imperial Chemical Industries, as do many other organisations in the country, carries its own insurance; and other firms insure through mutual indemnity associations. This paragraph does not refer to either method of insurance and compensation payments.) The procedure immediately raises an issue with regard to compensation payments which has an intimate bearing on the problem.

There is a feeling that the manner in which payments are made to injured workmen is frequently open to serious criticism, and that some of the present methods of insurance should be revised. No doubt the subject will be discussed in full by the interdepartmental committee whose report is awaited with interest and by the royal commission. Indeed, to avoid full investigation into the matter would be to evade one of the main issues and so reduce the value of other recommendations. The problem is primarily non-medical, but the direct effects on the patient and therefore on his relationship with the doctor are of undoubted importance to modern medicine.

Forcible statements on this question have been made by a number of authorities. In discussing the subject of industrial health the P E P report on the British Health Services, perhaps one of the most penetrating publications of our time, makes this statement: "Some of the methods insurance companies employ to induce injured men to take lump-sum payments, which are often cheaper to the company than annuities, are very questionable." And the B.M.A. committee on fractures reported that: "It is to be inferred that measures, such as here proposed, which will very materially reduce the total incapacity periods of the insured, will not necessarily be welcomed (by insurance companies), since that must involve a reduction of revenue through the lowering of premium."

GENERAL CONSIDERATIONS

Under present conditions the laws relating to workmen's compensation are not only often a hardship to the workman but also seriously handicap the doctor who is trying to do his best for the patient. Because of this fact the time has come for the medical profession to make a strong protest against such a state of affairs.

The present Act deals with compensation, but little is said about treatment. There is no onus on the injured man to provide himself with suitable treatment, and no suggestion that a good recovery is essential, even on purely economic grounds. Is there not a prima-facie case now for action? Have we forgotten the lessons of the late war and the work of the Ministry of Pensions, when treatment was all-important and was carried out by doctors of the highest skill, when a man could not refuse treatment or discontinue it without losing benefit and allowances, and when occupational training and rehabilitation, in a sense of the term not known today, were freely provided.

Rehabilitation, so much discussed at present, is a matter not by any means only for medical skill and knowledge. To be effective it must cater for the patient, both as a worker in industry and also as an individual member of a community and head of a home. The medical profession will do its best—of that there is no doubt—when the proper lead is given, but any alterations and improvements in the present methods of treatment and rehabilitation which may take place in the near future must of necessity be accompanied by fundamental alterations in the laws of the land.

PLACENTAL BLOOD FOR TRANSFUSION

BY JOHN HOWKINS, M.D., M.S. Lond., F.R.C.S.
RESIDENT PHYSICIAN-ACCOUCHEUR TO ST. BARTHOLOMEW'S HOSPITAL, LONDON; AND
H. F. BREWER, M.A., M.D. Camb.
CLINICAL PATHOLOGIST TO THE HOSPITAL

BLOOD for transfusion is likely to enjoy a boom, in which all sources of this valuable commodity will merit careful investigation. It is therefore opportune that there have recently appeared a number of communications on the possibilities of using placental blood for transfusion, and these must have aroused the curiosity of all interested in this work.

Neglecting for the moment the alleged advantages of placental blood, qua blood, such as increased erythrocyte and hæmoglobin content, absence of allergens and agglutinins, and enhanced hæmostatic powers, we have confined the issue by which this new source of supply is to be assessed to three essential questions of practical importance. The first of these is the *quantity*, which must be of such average proportion as to justify the trouble of collection, otherwise the source is uneconomical. The second is the *sterility* of the collected samples, when an ordinary aseptic routine is used against genital, air-borne, and droplet infection; a high percentage of contaminations immediately vitiates the whole method. Thirdly, it must be feasible to entrust the *collection* of the blood to the ordinary personnel of a hospital obstetric unit.

Goodall, Anderson, Altimas, and MacPhail (1938) described in some detail their methods of collection and preservation of placental blood, for which they used a formula later referred to in this article. Their average yield was 125 c.cm. and with regard to the

question of sterility they made the following observation: "cultures of the preserved blood are unnecessary because, at the low temperature for preservation, contamination, if present, could not propagate, and consequently would be so attenuated as to be innocuous." To both these points we refer later. These workers claim, moreover, that "in the many transfusions with fœtal blood there has not been one untoward reaction."

Grodberg and Carey (1938) in a similar investigation claimed an average yield of 105 c.cm.; they did not, however, use the same anticoagulant as Goodall and his colleagues, but substituted 15 c.cm. of a 2·5 per cent. sodium citrate solution, which is in close agreement with our own optimum solution, although they mention that they did in a few cases employ Goodall's formula, without stating what, if any, reactions they obtained from this. In this series 46 patients were transfused with a reaction ratio of 1 in 20. To test the sterility of the 235 samples collected Grodberg and Carey selected 26 and cultured these aerobically and anaerobically. Their vintage varied from 1 to 36 days and the cultures were uniformly sterile. The onus of collection was, presumably, in the hands of interns, as the operators are referred to as male. To all these points we shall severally refer later.

TECHNIQUE OF COLLECTION AND STORAGE

All infected and potentially infected cases, and all cases in which the baby is asphyxiated, must be excluded, and only normal clean deliveries used. As soon as the baby is born the cord is clamped with artery forceps in two places and divided. The operator responsible for the collection of the placental blood, after carefully swabbing the cord with surgical spirit or iodine, discards his or her dirty gloves and puts on a clean pair. The cord is compressed between the finger and thumb and the distal six inches, with the clamp attached, severed; the end of the cord is now inserted through a small hole in a sterile towel and allowed to drain, via a funnel, into a sterile container, into which has been poured the anticoagulant fluid. The purpose of the towel is to exclude air-borne and droplet infection and to prevent any fluid, contaminated from the genital tract and perineum, from seeping down the cord and into the container. After massaging the fundus and milking the cord to ensure the maximum possible yield, the container is sealed and placed, duly labelled with the date of collection, in a refrigerator at 38° F. A small test-tube is filled with enough blood to group the sample and affixed to the main container.

The actual container used by us for storing the blood was a rubber-stoppered milk bottle and a number of these were kept ready sterilised in a special drum in the labour theatre. The anticoagulant that we employed was 0·3 g. of sodium citrate in 10 c.cm. of sterile water and this was prepared specially for us in ready sealed ampoules by British Drug Houses Ltd., whom we wish to thank for their helpful coöperation. Before deciding on this anticoagulant, we experimented with one recommended by Goodall, Anderson, Altimas, and MacPhail (1938), according to their formula, which is taken from the Moscow Institute of Hæmatology. This consisted of the following ingredients:—

Sodium chloride	7·0 g.
Sodium citrate	5·0 g.
Potassium chloride	0·2 g.
Magnesium sulphate..	0·004 g.
Twice-distilled water ..	1000 c.cm.

"This solution is now put up in ampoules of 25 c.c. which, when added to 100 c.c. of distilled water, gives one the proper dilution, so that preservative and blood from each case is mixed in equal proportions, 125 c.c. of preservative and roughly 125 c.c. of blood." The result of using this solution was unsuccessful; not only did the blood clot in each case, but hæmolysis occurred in addition. These phenomena we attributed to the hypotonicity of the solution and the fact that the minimum requirement of citrate concentration percentage was not fulfilled. This percentage is generally recognised to be in the region of 0·3 g. sodium citrate to every 100 c.cm. of blood.

INVESTIGATION OF MATERIAL

Placental blood was collected as described from 50 cases, immediately after the delivery of the child, and stored in a refrigerator at 38° F. The average yield obtained was 47 c.cm. and the maximum 90 c.cm.

The sterility of the various samples was investigated at periods varying from six to fifteen days, employing the following technique. After gentle agitation to mix the blood uniformly in the bottle, 1 c.cm. was transferred to both peptone broth and cooked-meat medium. The former was incubated aerobically and the latter anaerobically in a McIntosh and Fildes jar and observations made up to a period of one week. The results of these primary cultures of the individual samples revealed that 22 per cent. were contaminated. The infecting organisms were for the most part saprophytes and comprised *Bacillus subtilis* group (12 per cent.), coliform bacilli (6 per cent.), white staphylococci (2 per cent.), and *B. pyocyaneus* (2 per cent.) These represent air-borne, skin, or genital-tract contamination.

Repeat cultures (aerobic and anaerobic) were made on the samples of blood after intervals of a further two to four weeks' cold storage; with the exception of one sample, when an organism of the *B. subtilis* group was obtained on the second culture only, the results were identical with the primary cultures.

DISCUSSION

The average quantity of placental blood collected from our 50 cases is small—i.e., 47 c.cm. which compares unfavourably with Goodall's and Grodberg's figures of 125 and 105 c.cm. respectively. In explanation of our modest average volume it should be emphasised that the samples were obtained from fifty consecutive placentæ, at term, without selection of the larger or rejection of the smaller samples. This small yield would necessitate the mixture of 10–12 samples to supply the bulk of blood usually employed in an adult transfusion; and it is questionable if this extensive pooling of several bloods, although of the same group, is entirely devoid of the risk of minor subgroup reactions of agglutination.

With regard to sterility, the result of our investigation showed that 22 per cent. of the samples were contaminated with air-borne or genital tract organisms. We can neither agree with Goodall in his assertion that culture of the collected blood is unnecessary, nor with Grodberg in his statement that any stray organisms present are usually killed by the leucocytes—a statement that we have proved to be incorrect, in that our second culture always tallied with our first, and organisms if present on the seventh day always survived up to the time of subsequent culture. We would hesitate to sponsor the lighthearted intravenous infusion of a thriving colony of *B. subtilis*, let alone one of *B. pyocyaneus*.

Thirdly, there arises the question whether the collection of placental blood can be feasibly entrusted to the ordinary personnel of a labour ward or whether it demands specially trained operators. Using a reasonably aseptic technique, we have found the contamination ratio high; moreover, the yield is disappointing. No doubt better results could be obtained if the blood were collected by, say, the resident obstetric staff. Such a necessity must throw an intolerable burden upon the shoulders of the officers concerned, the reward of which is trifling and questionable in comparison to the trouble involved.

Lastly, this source of blood for transfusion, however carefully perfected the technique of its collection, sterilisation, and storage, is unlikely seriously to rival that available through the voluntary-donor system, which we so fortunately have established in this country.

SUMMARY

1. The average volume of placental blood collected in 50 consecutive cases of normal labour at term was 47 c.cm.

2. The contamination percentage was 22 per cent.

3. The organisms were air-borne and genital-tract contaminants: *B. subtilis*, *B. coli*, *Staphylococcus albus*, and *B. pyocyaneus*.

4. Both these figures were obtained using the ordinary personnel of a labour ward, and not specially trained operators.

5. In such hands this source of blood is uneconomical in quantity and unsafe for human consumption.

We should like to acknowledge the assistance rendered in this investigation by the sister and staff of the labour ward, and by our laboratory technicians, Mr. E. Wilson and Mr. B. Cambridge.

REFERENCES

Goodall, J. R., Anderson, F. O., Altimas, G. T., and MacPhail, F. L. (1938) *Surg. Gynec. Obstet.* **66**, 176.

Grodberg, B. C., and Carey, E. L. (1938) *New Engl. J. Med.* **219**, 471.

THE PROPHYLAXIS OF TUBERCULOUS EMPYEMA

BY LAWRENCE ROBERTS, M.D. Lond., M.R.C.P.

ASSISTANT MEDICAL OFFICER, PAPWORTH VILLAGE SETTLEMENT, NEAR CAMBRIDGE

BY tuberculous empyema is meant suppurative pleurisy caused wholly or partly by the tubercle bacillus. This definition excludes (1) chronic pleural effusions which have become turbid by the admixture of endothelial cells and often contain tubercle bacilli and (2) transient infected effusions during artificial pneumothorax which clear without treatment.

ÆTIOLOGY AND PATHOLOGY

Tuberculous empyema occurs (1) as a common complication of spontaneous pneumothorax; (2) as an occasional complication of artificial pneumothorax; and (3) least often as an invariable consequence of invasion of the pleura by a burrowing tuberculous abscess of the chest wall. In all these circumstances heavy infection is the immediate cause.

The pleura is a serous membrane and has some power, comparable with that of the peritoneum, of resisting infection. For this reason acute pleurisy with effusion, a tuberculous condition, very rarely becomes transformed into empyema; the subpleural focus which has produced it does not provide an infection massive enough to overcome the protective power of the pleura. Occasionally the fluid may later become purulent, but the condition is usually afebrile, showing few or no signs of toxæmia, and constitutes one type of "cold pleural abscess" (Dumarest et al. 1936).

When spontaneous pneumothorax resolves completely without effusion, one is left in doubt whether the cause was tuberculosis or emphysema; but, when an effusion follows, tuberculosis is the cause. In such cases a caseous tuberculous focus involves both the pleura and the subjacent part of the lung, and produces both the fluid and the pleuropulmonary fistula through which air passes from the lung into the pleural cavity. Hence the later history of these patients is often bad. Of 26 patients with spontaneous pneumothorax mentioned by Burrell (1937) 17 developed tuberculous empyema, and of these 14 died.

Purulent effusion is a very grave complication of artificial pneumothorax treatment for pulmonary tuberculosis. In the series of reported cases which I have studied the incidence appears to be just over 10 per cent. Brock, Mullen, and Woodson (1937) reported 77 empyemas in 530 cases; Burrell (1937) 54 in 500 cases; Leaver and Hardaway (1937) 35 in 750 cases; Ferrari (1935) 18 in 200 cases; Dumarest and Brette (1929) 42 in 265 cases; and Peters (1921) 26 in 250 cases. These total 284 empyemas in 2646 cases (10·7 per cent.), and one may well suppose that the proportion would be higher rather than lower in unpublished cases.

It is now generally agreed that well-marked serous effusion in artificial pneumothorax is due to tuberculous pleurisy, only those negligible puddles in the costophrenic sinus being attributable to trauma. Burrell (1937) found that of 309 cases of artificial pneumothorax induced for pulmonary tuberculosis 41·4 per cent. were complicated by serous effusion, whereas of 54 induced for non-tuberculous disease less than 2 per cent. were complicated by effusion. His findings are supported by those of Morriston Davies (1933), Brock, Mullen, and Woodson (1937), and various other authorities. Since both serous and purulent effusions appear to be due to tuberculosis of the pleura, they are essentially alike in kind though differing in degree. It seems reasonable to suppose that the serous may progress to the purulent if the disease becomes more severe or the patient less resistant, and I consider that this takes place when collapse is unsatisfactory and the lesion in the lung remains active and progressive.

It has been said that serous effusion in artificial pneumothorax does not make the prognosis worse. With satisfactory collapse of the lung, with the pulmonary disease under control, and with adhesions absent or negligible, this is certainly true, and clinicians are not alarmed by an effusion in these circumstances; but with unsatisfactory collapse, with active and progressive pulmonary disease, and with troublesome adhesions, the effusion is a grave sign, and empyema is so likely to follow that active steps must be taken to prevent it. Hayes (1927) found that 31 out of 32 empyemas, and Leaver and Hardaway (1937) 14 out of 35, were preceded by serous effusion.

Pleural adhesions may lead to empyema in three different ways.

(1) By preventing collapse of the diseased area they may allow the lesion to remain active and progressive; when caseation eventually involves the pleura the resulting empyema is simply a sign

that the lesion has not been controlled. The patients usually do badly, and the object of treatment should be to prevent, rather than cure, empyema.

(2) Traction upon adhesions is thought by many to be a cause of serous effusion (Hutchinson and Blair 1926, Stobie 1930, Ford 1932); if the adhesion is torn at the base, allowing caseous material to escape into the pleura, empyema is the usual sequel. For this reason the former practice of leaving a high positive pressure at the conclusion of a refill to "stretch the adhesions" has now been abandoned. When adhesions rupture in these circumstances, empyema often results (Riviere 1927).

(3) Empyema may follow the therapeutic cauterisation of adhesions. The Jacobaeus operation has been of great value in many cases, and I have not the slightest intention of disparaging it. However, Jacobaeus himself (1920), in the early days of cauterisation of adhesions, recognised empyema as the most serious complication of his operation. Chandler (1932) has given a similar warning.

About other causes there is little to be said. Tuberculous abscesses of the chest wall sometimes arise from lymphatic glands; others arise from sternum, ribs, or vertebræ. Maurer, Rolland, and Roux (1935) consider that many are due to lymphatic spread from the pleura.

MORTALITY

The published figures for tuberculous empyema fall into two main groups:—

(1) Selected series of cases treated by a special method. These are valuable because they indicate useful lines of treatment, but they do not give a true idea of the mortality as a whole, since the workers have usually selected the patients most likely to respond to treatment.

(2) Unselected series of cases with total recovery and mortality rates. These include those of Burrell (1937), who had a mortality of 85 per cent. of 54 cases; Ostrowski (1936), 58 per cent. of 36 cases; Smart (1934), 44 per cent. of 71 cases; Jonsson (1934), 56 per cent. of 80 cases; Jones and Alexander (1934), 33 per cent. of 70 cases; Berry (1932), 55 per cent. of 75 cases; and Hedblom (1932), 24·5 per cent. of 143 cases.

The average mortality for published cases, then, is approximately 50 per cent. One must not suppose, however, that the remaining patients were cured. On the contrary, many were classed as "improved," which meant that they died slowly. The longer a series is followed up, the more patients meet this fate. Burrell's mortality appears higher, only because he followed up his patients over a longer period. And no doubt the mortality for unpublished cases would be greater still.

PROPHYLAXIS

Since spontaneous pneumothorax cannot be foreseen and tuberculous abscess of the chest wall can readily be treated, prophylaxis concerns chiefly the induction and management of artificial pneumothorax. This measure has produced brilliant cures in pulmonary tuberculosis, and I do not intend to belittle it in any way. Attention to a few points, however, helps to reduce its complications to the minimum.

There are certain contra-indications to the treatment, and one of them has not been much emphasised. Transient pain in the chest is of little consequence, but *constant or recurrent pleural pain over the lesion* indicates well-marked tuberculosis of the pleura, and artificial pneumothorax in such a case may be complicated by purulent effusion, with disastrous results. It must be decided whether pneumothorax should be postponed or entirely omitted. As Alexander (1937) has pointed out, there are ten distinct methods of collapse therapy, and when artificial pneumothorax is contra-indicated another method may be used.

Dumarest and Brette (1929) and other authorities consider that the treatment should not be begun during *menstruation*, for pleural effusion is more likely then.

Relaxation rather than compression of the lung is the aim of treatment. Collapse up to 60 per cent. is usually adequate; a high degree of collapse is seldom advisable and may be followed by non-expansion of the lung at the end of treatment. It is customary to leave *a small negative pressure* in the pleura at the conclusion of a refill. It is dangerous to leave high positive pressures to "stretch the adhesions." Although this may occasionally much increase the effectiveness of the pneumothorax, the chance is not so good that the life of the patient should be staked on it.

Termination of an ineffective pneumothorax is most important. The physician should review an established pneumothorax and decide whether it is controlling the disease or not. If not, more must be done: the amount of collapse may be altered or thoracoscopy performed, and adhesions cauterised. If the disease still remains active and progressive, more and more lung tissue becomes involved, and when empyema appears, as often happens, it is simply a sign that the lesion has become extensive. These empyemas do not respond to treatment, and the patients usually die of progressive lung disease. The ineffective pneumothorax should be promptly abandoned, for it is not only useless but wastes precious months during which another form of collapse therapy might be substituted.

In one type of case disease affects the whole, or a large part, of one lung, but pneumothorax maintains adequate collapse of only a part—e.g., the base. *Extrapleural pneumothorax* may then be performed to collapse the rest and refills given into both pneumothorax cavities; alternatively, the cavities may be joined into one by the procedure described by Brock (1938).

Oleothorax has its place in the prevention, as well as the treatment, of tuberculous empyema. Cases occur in which pneumothorax appears to be maintaining satisfactory collapse of the lung, but fluid appears, becomes turbid, and is found to contain tubercle bacilli. Such infected effusions sometimes clear spontaneously, and it is well to leave them alone at first; but, if they show signs of developing into frank empyemas, more must be done. This type of patient does well with oleothorax; Chandler (1930) has emphasised this and outlined the indications.

SUMMARY

(1) The incidence of tuberculous empyema in patients with artificial pneumothorax is about 10 per cent. and its fatality-rate, in published cases, about 50 per cent. Therefore prevention seems especially important. (2) It is suggested that persistent or recurrent pleural pain over the lesion indicates severe tuberculosis of the pleura, which contra-indicates artificial pneumothorax. The risk of empyema is sufficiently great to make some other form of collapse therapy advisable. (3) The object of artificial pneumothorax is relaxation, not compression, of the lung. High positive pressures to "stretch the adhesions" are not justifiable. (4) After cauterisation of adhesions and adjustment of collapse, a pneumothorax which remains ineffective

should be promptly abandoned and other collapse therapy substituted. Oleothorax and extrapleural pneumothorax are valuable in certain cases.

REFERENCES

Alexander, J. (1937) The Collapse Therapy of Pulmonary Tuberculosis, London, 1ED.
Berry, F. B. (1932) *J. thorac. Surg.* **2**, 139.
Brock, B. L., Mullen, A. B., and Woodson, T. A. (1937) *Amer. Rev. Tuberc.* **35**, 548.
Brock, R. C. (1938) *Brit. J. Tuberc.* **32**, 173.
Burrell, L. S. T. (1937) Recent Advances in Pulmonary Tuberculosis, Philadelphia, 3ED, pp. 282, 291.
Chandler, F. G. (1930) *Tubercle, Lond.* **11**, 255.
— (1932) *Ibid*, **14**, 49.
Davies, H. M. (1933) Pulmonary Tuberculosis, Medical and Surgical Treatment, London, p. 251.
Dumarest, F., and Brette, P. (1929) La Pratique du pneumothorax thérapeutique et de la collapsothérapie chirurgicale, Paris, p. 151.
— Lefèvre, P., Mollard, H., Pavie, P., and Rougy, P. (1936) La Pratique du pneumothorax thérapeutique, Paris.
Ferrari, V. (1935) *Arch. Med. Chir.* **4**, 813.
Ford, A. P. (1932) *Tubercle, Lond.* **13**, 292.
Hayes, J. N. (1927) *Amer. Rev. Tuberc.* **16**, 680.
Hedblom, C. A. (1932) *Acta chir. scand.* **71**, 311.
Hutchinson, R. C., and Blair, L. G. (1926) *Tubercle, Lond.* **7**, 417.
Jacobaeus, H. C. (1920) *Acta chir. scand.* **53**, 293.
Jones, J. C., and Alexander, J. (1934) *Amer. Rev. Tuberc.* **29**, 230.
Jonsson, E. (1934) *Acta tuberc. scand.* **8**, 191.
Leaver, F. Y., and Hardaway, R. M. (1937) *Amer. Rev. Tuberc.* **35**, 538.
Maurer, A., Rolland, J., and Roux, M. (1935) *Mém. Acad. Chir.* **61**, 1399.
Ostrowski, W. (1936) *Gruzlica (Tuberculosis, Warsz.)* **11**, 174.
Peters, L. S. (1921) *Amer. Rev. Tuberc.* 22, **5**, 599.
Riviere, C. (1927) Pneumothorax, and Surgical Treatment of Pulmonary Tuberculosis, Oxford, p. 222.
Smart, E. P. (1934) *J. thorac. Surg.* **3**, 413.
Stobie, W. (1930) *Tubercle, Lond.* **11**, 253.

RENAL CHANGES IN MALIGNANT HYPERTENSION

EXPERIMENTAL EVIDENCE*

BY CLIFFORD WILSON, D.M. Oxfd

ASSISTANT DIRECTOR OF THE MEDICAL UNIT, LONDON HOSPITAL; AND

F. B. BYROM, M.D. Lond., M.R.C.P.†

(WITH ILLUSTRATIONS ON SPECIAL PLATE)

FORTY-FOUR years ago Clifford Allbutt (1895), delivering the first Hunterian Society's lecture, described a group of patients with high blood-pressure who at no time developed any clinical signs of renal disease. Afterwards he applied the term hyperpiesia to this condition. His distinction between "essential" hypertension and the hypertension associated with chronic renal disease has been of great value in forecasting the clinical course in the majority of cases of high blood-pressure. There remain however some cases that fall into neither group—namely, those in which the patient seems at first to be suffering from essential hypertension, yet contrary to Allbutt's teaching, the disease runs a malignant course to end in renal failure within a few years.

This group has been struggling for recognition ever since Volhard and Fahr (1914) presented their classification of Bright's disease. Fahr (1919) termed the condition "malignant sclerosis" to emphasise the occurrence in the kidney and other organs of severe arterial lesions which he regarded as the primary cause of the hypertension. The clinical term "malignant hypertension" has however proved more acceptable and has been justified by recent clinical and pathological studies (Kimmelstiel and Wilson 1936, Ellis 1938) from which it appears that in the early stages of the condition renal changes are minimal or absent, the "nephrosclerosis" of Volhard and Fahr representing only the final stage of the disease. The conception of a malignant form of essential hypertension is nevertheless creeping only uncertainly into general use. There are three main reasons for this uncertainty:—

1. If essential hypertension can lead to renal failure it is difficult to understand why it does not do so in the vast majority of cases.

2. Cases of undoubted acute nephritis which become chronic may develop terminal features, both clinical and histological, which are indistinguishable from those of malignant hypertension—namely, a very high blood-pressure, with marked hypertensive symptoms (encephalopathy and retinopathy) and rapidly progressive renal failure; and histologically the association of acute gomerular lesions with arterial necroses in the kidney and in other organs.

3. If we exclude cases where death takes place in the early stages, the kidneys in malignant hypertension show gross damage in the shape of a "chronic interstitial nephritis," the characters of which, and especially the glomerular lesions, have been regarded as consistent only with a long-standing, *primary* nephritis.

If it could be shown experimentally that this picture of chronic interstitial nephritis may be caused *by hypertension alone*, the concept of malignant hypertension would be greatly strengthened. It is the object of this paper to present such evidence.

HYPERTENSION AND RENAL ISCHÆMIA

During the past few years much work has been done on experimental hypertension induced in animals by reducing the blood-supply to the kidney. Goldblatt and his colleagues (1934) greatly stimulated this type of investigation by the introduction of an adjustable clamp for producing partial occlusion of the renal arteries in dogs. They showed that constriction of both renal arteries, or alternatively of one renal artery with removal of the opposite kidney, gave rise

LEGENDS TO ILLUSTRATIONS ON PLATE

1—Rat kidney. Acute necrosis of afferent arteriole to glomerulus. (Hæmatoxylin and eosin, × 260.)

2—Human kidney. Malignant hypertension. Acute necrosis of afferent arteriole to glomerulus. (Hæmatoxylin and eosin, × 165.)

3—Rat kidney. "Explosive" type of arterial necrosis; red blood-cells and fibrin deposited in vessel wall. (Hæmatoxylin and eosin, × 140.)

4—Human pancreas. Malignant hypertension. Similar type of arterial necrosis; red blood-cells and fibrin in wall. (Hæmatoxylin and eosin, × 155.)

5—Rat kidney. Cellular thickening of intima of a medium-sized artery ("endarteritis fibrosa"). Elastica interna greatly stretched and fragmented. (Weigert's elastic stain, × 170.)

6—Human kidney. Malignant hypertension. Similar lesion in interlobular artery. (Weigert's elastic stain, × 290.)

7—Rat kidney. Acute focal glomerular necrosis. (Hæmatoxylin and eosin, × 210.)

8—Human kidney. Malignant hypertension. Acute focal glomerular necrosis. (Hæmatoxylin and eosin, × 185.)

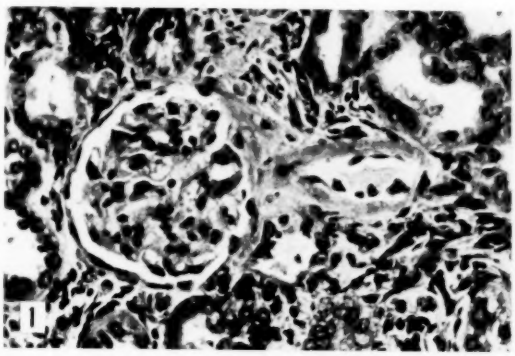
* Communicated to the Medical Research Society, Dec. 9, 1938.

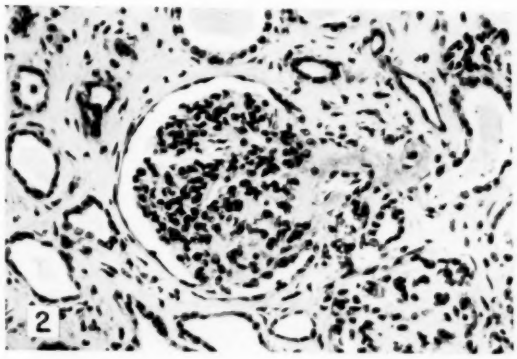
† In receipt of a full-time grant from the Medical Research Council; working in the Bernhard Baron institute of pathology, London Hospital.

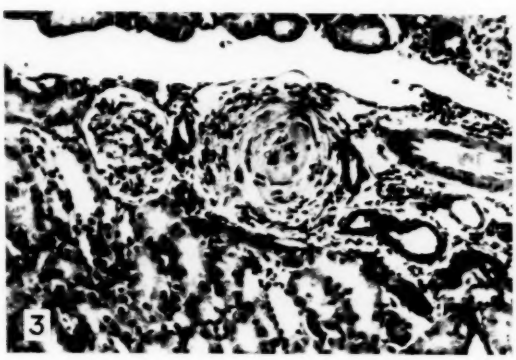
DRS. WILSON AND BYROM: RENAL CHANGES IN MALIGNANT HYPERTENSION

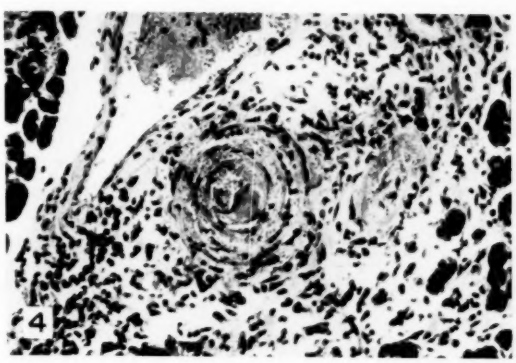
RAT KIDNEY

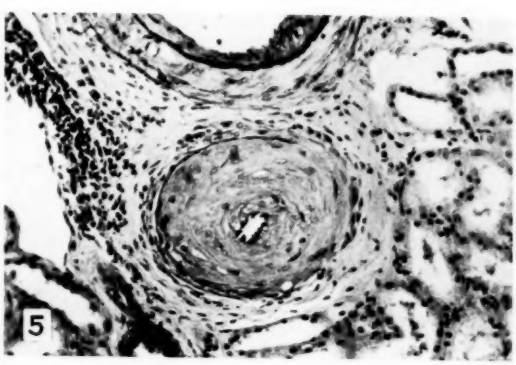
HUMAN KIDNEY

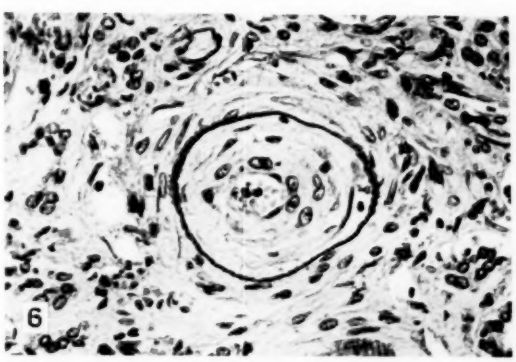


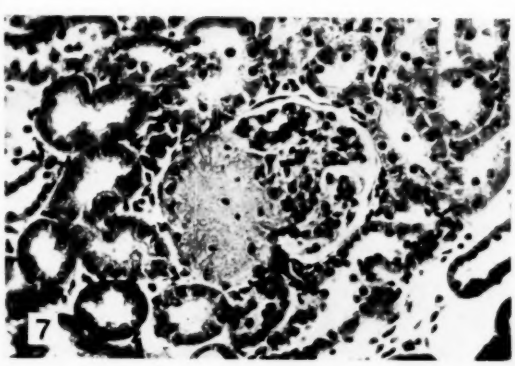


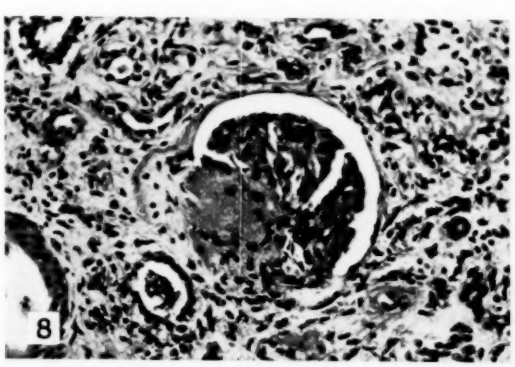








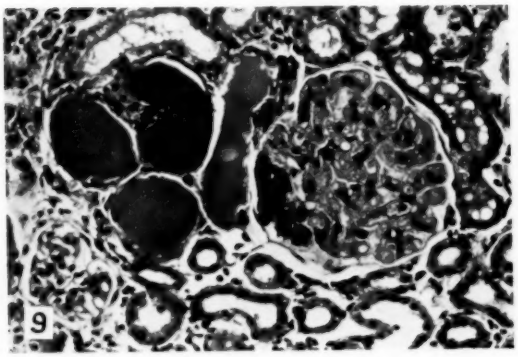


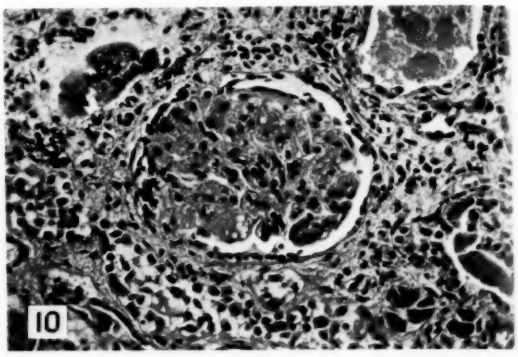


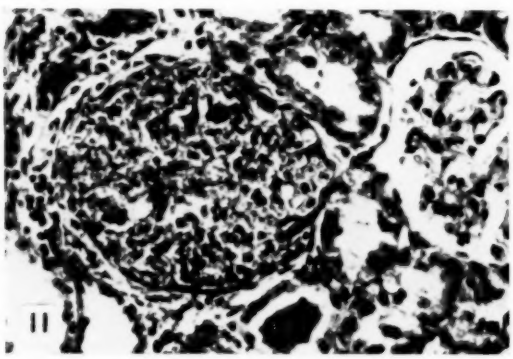
DRS. WILSON AND BYROM: RENAL CHANGES IN MALIGNANT HYPERTENSION

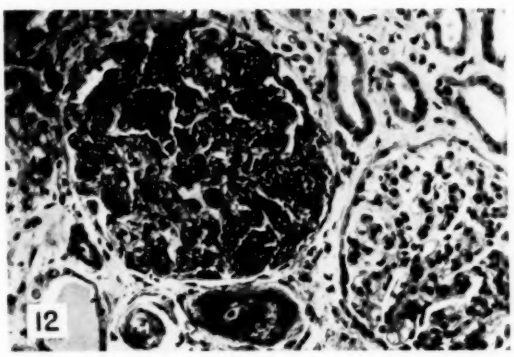
RAT KIDNEY

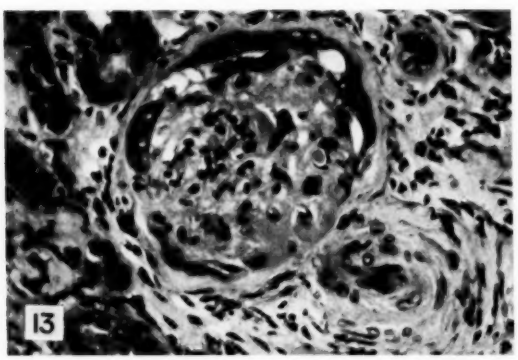
HUMAN KIDNEY (Figs. 10, 12, 14)

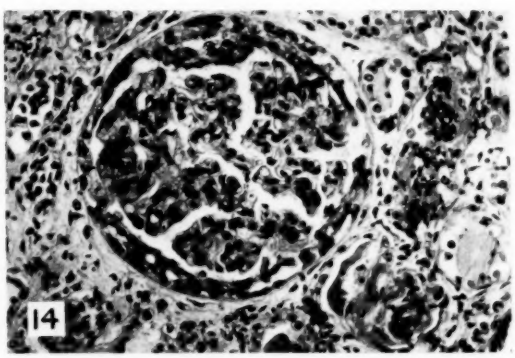


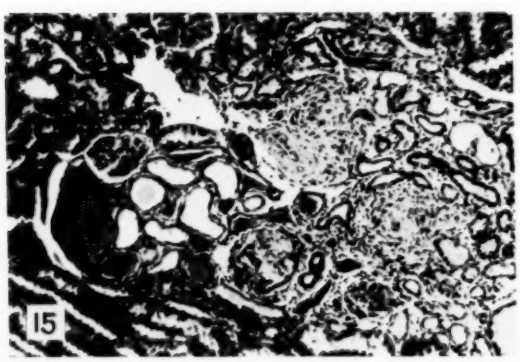


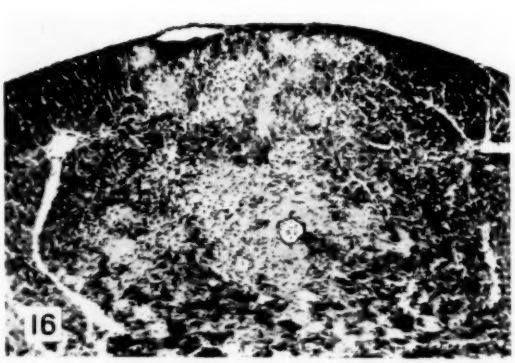












to a long-sustained elevation of the blood-pressure. Wilson and Pickering (1938) recently showed that in rabbits with hypertension produced by this technique acute arterial lesions identical with those of malignant hypertension could be demonstrated in various organs, particularly in the intestines; but these lesions were not found in the kidneys. Since the kidney is one of the commonest sites for acute vascular lesions in man, their absence from the rabbit's kidneys is significant. It strongly suggests that the lesions found in organs other than the kidney are caused by increased arterial tension, from which the renal arterial system is protected by the clamp on the renal artery. Goldblatt (1938) has described acute arterial lesions of a similar distribution in his hypertensive dogs, but since he observed the lesions only when the degree of constriction of the renal arteries was severe enough to produce renal insufficiency he concludes that this, as well as hypertension, is an essential factor in their causation.

It must be emphasised that in the above experiments hypertension was produced by constriction of both renal arteries, or of one renal artery after excision of the opposite kidney. It was therefore impossible to study the effects of the hypertension on an intact kidney. The present paper is based on experiments on rats in which one renal artery was partially occluded, *the opposite kidney being left intact.* In the dog partial occlusion of one renal artery may lead to hypertension, but this is usually transient and seldom lasts more than a few weeks (Goldblatt et al. 1934, Wood and Cash 1936). In rats however we have found that this procedure quite often gives rise to a persistent hypertension.

Method and Results of the Experiments

In young adult rats of both sexes the kidney was exposed by a lumbar incision and the renal artery was compressed by one of two methods. In 28 animals a wire was placed alongside the artery and a ligature tied round both; the wire was then removed leaving the artery partially constricted. Subsequently in 129 animals we have used clips made from annealed silver ribbon and applied after the method described by Pickering and Prinzmetal (1938) for rabbits; with this method there is less risk of infarcting the kidney.

Systolic blood-pressures were recorded weekly by the plethysmographic method (Byrom and Wilson 1938), using light ether anæsthesia.

The blood-urea has been determined by a modification of the urease method on 0·2 c.cm. of blood taken from the tail.

So far 35 animals have been killed at intervals ranging from five days to six months after the development of hypertension. Portions of both kidneys, intestine, stomach, suprarenal glands, liver, pancreas, spleen, testicles, voluntary muscle, heart, brain, and eye have been examined histologically after fixation in saline formaldehyde. Sections were stained by Ehrlich's hæmatoxylin and eosin, Weigert's fuchselin stain for elastic tissue, and Weigert's hæmatoxylin and van Gieson's stain.

THE CLINICAL PICTURE

Compression of one renal artery has been performed on 157 rats and has given rise to hypertension in 101 (65 per cent.). The blood-pressure may be elevated as early as eighteen hours after the operation, or may begin to rise at any time during the first four weeks. The usual rise is from the normal mean of 106 mm. Hg to a level of 160–180 mm. Values of 200 mm. and over are not uncommon, the highest reading we have observed being 260 mm. Hg. The course of the hypertension varies considerably, but in general two main types may be recognised :—

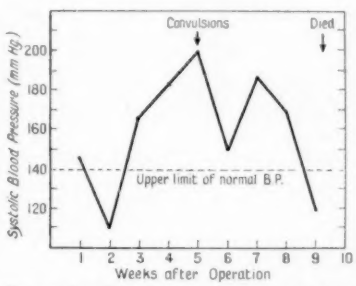


CHART 1.—Blood-pressure curve of a rat following constriction of the right renal artery.

(1) Those in which the blood-pressure rises gradually over a period of several weeks to reach a steady high level which, in animals still under observation, has been maintained for nine months and appears to be consistent with normal health.

(2) Those in which the hypertension runs a more irregular course and often leads to a state of great weakness, wasting, coma, and occasionally convulsions. These symptoms are not due to renal insufficiency; for the blood-urea is within normal limits, and removal of the clamped kidney may be followed by rapid clinical improvement with return of the blood-pressure to the normal level. In this second type the blood-pressure chart usually shows one or more peaks of hypertension followed by relatively normal or subnormal values. In several instances such a peak has preceded the onset of fatal symptoms, the pressure falling steeply before death (chart 1). The fall in blood-presure in these animals may be caused by two factors: (*a*) Heart failure due to the severe acute arterial lesions and perivascular hæmorrhagic necrosis which are invariably found in the myocardium in these cases (fig. 16 on plate). (*b*) The occurrence of widespread acute arterial lesions in other organs. It is possible moreover that sometimes the recorded pressure is lower than the actual value, owing to the effect of anæsthesia on an ill rat (Chanutin and Ferris 1932). In 3 rats out of 36 which have developed the syndrome described above, the symptoms came on without any hypertension having been recorded. It appears however that when

LEGENDS TO ILLUSTRATIONS ON PLATE

9—Rat kidney. "Coagulative" type of necrosis of glomerular tuft. (Hæmatoxylin and eosin, × 200.)

10—Human kidney. Malignant hypertension. Similar type of glomerular necrosis. (Hæmatoxylin and eosin, × 160.)

11—Rat kidney. Hæmorrhagic infarction of glomerulus. (Hæmatoxylin and eosin, × 280.)

12—Human kidney. Malignant hypertension. Hæmorrhagic infarction of glomerulus; fibrinoid necrosis of afferent arteriole. (Hæmatoxylin and eosin, × 190.)

13—Rat kidney. Necrosed glomerulus with swelling and proliferation of capsular epithelium; fibrinoid necrosis of afferent arteriole. (Hæmatoxylin and eosin, ×260.)

14—Human kidney. Malignant hypertension. Similar lesion of glomerulus with epithelial proliferation. (Hæmatoxylin and eosin, × 185.)

15—Rat kidney. Low-power view showing association of arterial and glomerular lesions with tubular atrophy and dilatation. (Hæmatoxylin and eosin, × 88.)

16—Rat heart. Perivascular hæmorrhagic necrosis of myocardium. (Hæmatoxylin and eosin, × 55.)

blood-pressures are taken at only weekly intervals a sudden hypertensive crisis may occasionally be missed.

The urea content of the blood has been measured in 24 rats presenting symptoms. In 2 animals readings of 114 and 424 mg. per 100 c.cm. were obtained. In the second, however, the level had fallen to 70 mg. seven days later. With these exceptions, 28 readings from 22 rats ranged from 40 to 72 mg. with a mean value of 55 mg. Using the same technique, 16 control rats gave readings ranging from 34 to 81 mg. with a mean of 52 mg. Nitrogen-retention is therefore not an essential feature of the syndrome.

THE PATHOLOGICAL PICTURE

(1) *The "clamped" kidney* occasionally presents no macroscopic or histological abnormality; more often diffuse tubular atrophy is evident, all degrees being observed from slight to very severe; partial infarction of the kidney is not uncommon. Acute glomerular and arterial lesions such as occur in the opposite kidney have not been observed. Eliminating the cases with infarction, the degree of cortical atrophy tends to be greater in rats with the second type of hypertension described above; occasionally however the kidney appears histologically normal even in these cases. In the first type, the clamped kidney usually looks normal in size but microscopically there may be slight narrowing of the cortex with diminution in size of the glomeruli in the subcapsular zone.

(2) *The opposite kidney.*—To the naked eye this may appear normal, but minute yellow or red flecks are not infrequently seen under the capsule. Microscopically changes are present which closely resemble those of malignant hypertension in man. This resemblance is illustrated in the plate (figs. 1–14) where each lesion in the rat kidney is shown with its counterpart from a case of malignant hypertension. The lesions are focal in distribution, glomeruli, tubules, and interstitial tissue showing changes closely associated with acute arterial necrosis (fig. 15).

Medium and small *arteries*, particularly the vasa afferentia, are affected; the simplest change is a hyaline or fibrinoid swelling of the vessel wall with disappearance and fragmentation of nuclei and dilatation of the lumen (figs. 1 and 2). More frequently, what may be described as an "explosive" type of lesion is seen in which all coats of the vessel wall may be necrosed, and may contain fibrin and red blood-cells; the lumen is narrowed by the intimal swelling and there is an adventitial cellular reaction of an inflammatory type (figs. 3 and 4). In addition to these acute lesions a cellular thickening of the intima is often observed, the lumen being greatly narrowed and the elastica interna stretched and fragmented (figs. 5 and 6).

The glomeruli show a great variety of acute and chronic changes; focal necrosis of the tuft is the characteristic lesion, the capillary loops undergoing hyaline or fibrinoid change with disappearance of nuclei and adhesion to Bowman's capsule (figs. 7 and 8). Occasionally the whole tuft shows an anæmic, coagulative type of necrosis with swelling of the capillary walls and obliteration of their lumina (figs. 9 and 10). In some glomeruli the necrotic areas contain fat droplets and large, round, foam cells. Another striking picture is produced by hæmorrhagic infarction of the glomerulus, the capillary walls having almost disappeared leaving spaces stuffed with blood (figs. 11 and 12). Less acute changes are seen, with extensive adhesions to Bowman's capsule, increased cellularity of the tuft with loss of its lobular pattern, and periglomerular fibroblastic proliferation; conspicuous enlargement and occasional proliferation of the parietal and visceral epithelium are observed (figs. 13 and 14). These glomerular changes are usually associated with necrosis of the afferent arterioles; occasionally, as in malignant hypertension, the arteriole is necrotic but the glomerulus appears normal. Acute arteriolar necrosis has been observed in the kidney as early as four days after constricting the opposite renal artery; in such early cases glomerular lesions are rarely found.

The adjacent tubules are often abnormal (figs. 9 and 15); some are dilated and contain hyaline casts, their epithelium being flattened or absent, others are atrophied, devoid of lumina, and widely separated by interstitial fibrosis. There is usually severe albuminous degeneration of the tubular epithelium; hyaline droplet degeneration is occasionally present but this has also been seen in the clamped kidney.

Between the affected areas the renal elements appear normal and it must be emphasised that the greater part of the kidney tissue shows no obvious change. In this respect the picture differs from the classical one of malignant hypertension in man, where—particularly in the later stages—renal damage and interstitial fibrosis are more extensive. This difference may be attributed to the relatively short duration of the hypertension in the present experiments.

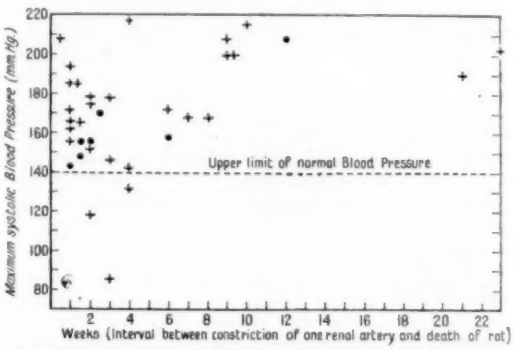


CHART 2—Incidence of acute arterial lesions in relation to maximum recorded blood-pressure and duration of hypertension. + = lesions present; ● = lesions absent.

(3) *Other organs.*—Acute arterial lesions similar to those described above were observed in the pancreas, intestine, stomach, and heart, and more rarely in the suprarenal glands, liver, and testis. Lesions were not found in the brain, eye, and striated muscle. The most severe lesions were seen in the mesenteric arteries where gross changes resembling those of periarteritis nodosa were not uncommon.‡ Excluding the eye and brain, which were only occasionally examined, this incidence of the lesions corresponds to their distribution in malignant hypertension. Focal necroses have been found almost invariably in the heart (fig. 16), less constantly in the pancreas, and occasionally in the liver; these lesions closely resemble the *Fleckherz*, *Fleckleber*, and *Fleckpankreas* described in malignant hypertension.

Of the 35 rats so far studied histologically, acute vascular lesions have been found in various organs in 28, and in the kidney in 27. These figures do not represent the true incidence of the lesions in hypertensive rats since we have killed only a small number of animals with the chronic type of hypertension in which vascular lesions tend to be minimal or absent. Chart 2 shows the incidence of acute arterial

‡ Wilens and Sproul (1938) have described spontaneous arterial lesions, closely resembling those of periarteritis nodosa, in adult rats over the age of 500 days. The rats used in our experiments were well below this age-limit.

lesions in relation to the maximum recorded height of the blood-pressure, and its duration before the animal was killed.

Pathogenesis of the Lesions

Since only one kidney is operated on, renal insufficiency is an unlikely factor in the ætiology of the lesions. This conclusion is supported by the absence of nitrogen-retention. The fact that the lesions do not occur in the clamped kidney appears to indicate (1) that they are not due to a circulating toxin, (2) that they are not due to simple ischæmia, (3) that vasoconstriction due to a circulating pressor substance cannot be *solely* responsible for them. It is concluded therefore that the production of the lesions is related in some way to the increased intra-arterial tension from which the ischæmic kidney is protected by the clip on the renal artery. We can say with certainty that neither the absolute level of the blood-pressure, nor its duration, is an essential factor, since the lesions have been minimal or absent in animals with a blood-pressure of over 200 mm. Hg persisting for many months. We incline to the belief that the determining factor is probably a sudden strain imposed on the vessel wall by the combination of severe vasoconstriction and the resultant rapid rise in blood-pressure. This could presumably produce a vascular necrosis which in the case of a gradually rising pressure might be prevented by the development of compensatory hypertrophy of the arterial wall. The conception that arterial necrosis may result from a mechanical strain on the vessel wall is supported by the observation (Byrom 1937) that when vasopressin is administered to rats in doses large enough to blanch the kidneys, similar acute necrotic lesions are found in the renal arteries.

Clinical Implications

The close resemblance between the renal lesions produced in the rat by experimental hypertension and those found in cases of malignant hypertension in man bespeaks a common pathogenesis. It provides experimental support for the clinical evidence already cited that malignant hypertension is a form of essential hypertension of which renal disease is but a terminal manifestation. The term "malignant nephrosclerosis" may be applied to this final stage, but it does not indicate the true nature of the disorder. It is to this stage that the term "chronic interstitial nephritis" is also applied, the lesions in the kidney being regarded as "inflammatory." Since a similar picture occurs in the hypertensive rat under conditions which apparently exclude the influence of "toxic" agents, we infer that such "inflammatory" changes can result from a hypertension severe enough to produce arterial necrosis.

The demonstration that arterial lesions can be produced in the kidney by experimental hypertension also throws light on the clinically malignant course of the human disease; for when vascular lesions occur in malignant hypertension as a result of the high blood-pressure, they will presumably give rise to a reduction in renal blood-flow. This may be expected to aggravate the hypertension, and so a vicious circle will be established in which a rising blood-pressure is associated with progressive renal destruction.

Furthermore we have already described in the introduction the striking and hitherto perplexing similarity, both clinical and histological, that may characterise the terminal stages of chronic nephritis and malignant hypertension. The same manifestations may occasionally be observed in the terminal phase of *any* form of chronic renal disease with high blood-pressure. It thus appears that not only "essential" hypertension but also hypertension secondary to renal disease can set in motion the vicious circle which we have envisaged above. This "malignant termination" has therefore no specific character derived from the original disease but is an attribute of the high blood-pressure which is common to all.

It is however desirable to restrict the term "malignant hypertension" to its present usage—namely, the malignant form of *essential* hypertension—thereby emphasising its fundamental difference from chronic nephritis and preserving the existing subdivision of essential hypertension into benign and malignant forms.

The clinical symptoms in the hypertensive rat also stand in close relation to the human disease. The syndrome we have described of weakness, wasting, coma, and convulsions has been produced by operative interference with one kidney and is not attended by renal insufficiency. In animals moribund from this condition immediate and lasting improvement, with return of the blood-pressure to normal, has been produced by excision of the ischæmic kidney. The syndrome appears to be a close counterpart to hypertensive encephalopathy in man (the pseudo-uræmia of Volhard).

Summary

Sustained hypertension has been produced in rats by partial occlusion of one renal artery.

Histological changes are often found in the opposite kidney and these appear to be identical with the lesions of malignant hypertension in man. It is concluded that these changes are due to the vascular strain imposed by a rapidly developing hypertension; renal failure apparently plays no part in their origin. These findings strengthen the conception of malignant hypertension as a form of essential hypertension in which the renal lesions are a secondary manifestation.

In hypertensive rats the occurrence of these lesions is frequently associated with a clinical syndrome consisting of weakness, wasting, convulsions, and coma, which is not accompanied by nitrogen-retention and which is relieved by excision of the ischæmic kidney.

The similarity, both clinical and histological, which frequently characterises the terminal stages of various forms of chronic Bright's disease is attributed to a vicious circle in which hypertension produces renal vascular lesions and these, by further reducing the blood-flow through the kidneys, aggravate the hypertension and lead to rapidly progressive renal destruction and functional insufficiency.

We should like to express our gratitude to Prof. Arthur Ellis, whose clinical studies of Bright's disease have stimulated these investigations, and to Prof. Hubert M. Turnbull in whose department the work was carried out.

REFERENCES

Allbutt, C. (1895) *Trans. Hunter. Soc.* 1895–96, p. 38.
Byrom, F. B. (1937) *J. Path. Bact.* **45**, 1.
— and Wilson, C. (1938) *J. Physiol.* **93**, 301.
Chanutin, A., and Ferris, E. B. (1932) *Arch. intern. Med.* **49**, 767.
Ellis, A. (1938) *Lancet*, **1**, 977.
Fahr, T. (1919) *Virchows Arch.* **226**, 119.
Goldblatt, H. (1938) *J. exp. Med.* **67**, 809.
— Lynch, J., Hanzal, R. F., and Summerville, W. W. (1934) *Ibid*, **59**, 344.
Kimmelstiel, P., and Wilson, C. (1936) *Amer. J. Path*, **12**, 45.
Pickering, G. W., and Prinzmetal, M. (1938) *Clin. Sci.* **3**, 357.
Volhard, F., and Fahr, T. (1914) Die Brightsche Nierenkrankheit, Berlin.
Wilens, S. L., and Sproul, E. E. (1938) *Amer. J. Path.* **14**, 201.
Wilson, C., and Pickering G. W. (1938) *Clin. Sci.* **3**, 343.
Wood, J. E., and Cash, J. R. (1936) *J. clin. Invest.* **15**, 543.

THE INTERRUPTION OF COMA IN INSULIN SHOCK THERAPY

BY RUSSELL FRASER, M.B. N.Z., M.R.C.P.
ASSISTANT MEDICAL OFFICER, MAUDSLEY HOSPITAL, LONDON; AND
DOUGLAS A. STANLEY, B.Sc. Lond.
CENTRAL PATHOLOGICAL LABORATORY, MAUDSLEY HOSPITAL, LONDON

THE treatment which Sakel introduced in 1933 consists in injecting insulin to induce hypoglycæmic coma, which is later interrupted by giving a nasal feed of sugar. Ideally, the dose of insulin and the duration of coma are adjusted so that the nasal feed alone will result in recovery within half an hour. However, from day to day sudden changes may occur in the patient's insulin sensitivity, slight but significant changes in the depth of hypoglycæmic coma may be overlooked, or for therapeutic reasons it may be decided to lengthen the coma. Consequently, few, if any, "insulin therapists" do not have to resort occasionally to intravenous injection of glucose when recovery is delayed or has been accompanied by vomiting. When such complications occur, it is legitimate to wonder whether the nasal feed had contained sufficient sugar in the dilution most suitable for rapid absorption by a hypoglycæmic patient. In some of these cases the intravenous injection of glucose does not produce immediate recovery of consciousness, and here, particularly, arise the further questions of how much glucose should be given intravenously and whether harm may result from giving too much. Some observations bearing on these questions are reported in this paper.

METHODS AND RESULTS OF INVESTIGATION

Our method has been to study the recovery period after carefully standardised comas interrupted by nasal feeds or by intravenous injections of different amounts of glucose. The time till awakening was noted, and frequent capillary blood-sugar estimations were made during the recovery period. Samples of venous blood were taken on some occasions to study any changes of hydration in the blood. Blood-sugar estimations were done by the standard Hagedorn and Jensen technique; samples which were anticipated to be over 300 mg. per 100 c.cm. were diluted five times before estimation. Other estimations were made on venous blood. Hæmoglobin was estimated colorimetrically as acid hæmatin by the standard method with the Newcomer disc. Total serum-protein values were obtained by estimation of the total serum nitrogen by the Kjeldahl titration method, the total-nitrogen figures being multiplied by 6·25.

The amount of sugar in the routine nasal feed is calculated in some clinics (Hunt and Feldman 1937) from the dose of insulin. It is, however, a common observation that different patients will have hypoglycæmia of comparable severity after widely different doses of insulin. But, since the amount of sugar needed for interruption probably depends most closely on the severity of the hypoglycæmic state, this method of calculating does not seem to be sound. The duration of coma is probably the best index of the severity of the hypoglycæmia and might provide a better method of estimating the required dose of sugar. It is of course likely that there are some slight personal differences in the amount of sugar needed to interrupt a coma of standard severity in different patients, but these could probably be ignored. It is, however, more satisfactory to have a routine practice of giving a standard nasal feed and modifying this only when necessary to suit special cases. The standard food should contain sufficient sugar to interrupt the deepest therapeutic coma and to prevent recurrence of hypoglycæmia before the dinner is given. This is probably the most widespread practice (Sakel 1938, Müller 1936, von Braunmühl 1938, Wilson 1936), and we give the routine nasal interruption feed, advocated by Müller (1936), of 600 c.cm. of weak tea containing 200 g. of sugar (33 per cent.). The tea is a useful addition, particularly because during Stage I and Stage IV this fluid can also be given as a drink which is relatively palatable when mixed with lemon. Although many patients do not need all this sugar to interrupt the hypoglycæmia, there is no evidence that an excess is a disadvantage, and it is probably advantageous to have a standardised interruption feed throughout the treatment, which simplifies the nursing and helps to standardise the carbohydrate intake. It is also customary to give some sandwiches half an hour after the nasal feed to provide a more prolonged absorption of sugar, so that the dinner need not be given till at least half an hour later, when a full appetite will have returned.

Absorption might, however, occur more rapidly from a more diluted feed or from a smaller volume of fluid. To investigate these possibilities, five patients were given on successive days, after exactly comparable comas (insulin dose and duration and depth of coma), three different nasal feeds: the standard feed (600 c.cm. of 33 per cent. sugar), half its volume (300 c.cm. of 33 per cent. sugar), and half its concentration (600 c.cm. of 15 per cent. sugar). The results of observations during the recovery period after these different methods of interruption are recorded in table I, which shows the time of awakening (to recovery of speech) and a series of blood-sugar estimations. The usual bread and butter was given three-quarters of an hour after the nasal feed on each day. It will be noted that there is scarcely any significant difference between the rapidity of recovery after 600 c.cm. of 33 per cent. sugar and that after 600 c.cm. of 15 per cent. sugar. Though the 33 per cent. sugar was perhaps slightly more effective with Patients N. and W., and slightly less effective in Db., there was no difference with the others. Consequently, without more definite evidence of a more rapid absorption of the 15 per cent. feed, it seems from theoretical reasons better to give more sugar and to use a 33 per cent. feed. But it will be noted that the recovery after 300 c.cm. of 33 per cent. sugar is probably significantly slower (Patients Db. and N.). It will be noted that one patient (Case M.) was hypoglycæmic just before the midday meal one hour and three-quarters after this feed—which did not happen with either of the other feeds. From these observations it is concluded that it is undesirable to give as a routine either less volume than 600 c.cm. or less concentration of sugar than 33 per cent. in the nasal feed.

The possibility of giving a more concentrated feed was not investigated, since it was felt that this might be too irritating to the stomach, in view of the hæmatemesis occasionally observed after the usual interruption feed. Although some clinics use slightly smaller volumes (James et al. 1937), there seems little reason to consider 600 c.cm. too bulky, since vomiting only rarely follows its administration. But, on general principles, it would seem unwise to add to this volume and so increase the probability of vomiting.

When patients have not recovered half an hour after the nasal feed, the blood-sugar is nearly always at hypoglycæmic levels; consequently, one of the causes of this complication must be a delay in absorption, due probably to the severity of the hypoglycæmia. For this reason, correct treatment of such cases must provide for ensuring a blood-sugar level above normal until absorption is fully restored. In cases in which vomiting has been the indication for the intravenous injection of glucose it is again important to maintain a normal blood-sugar until the stomach can once more retain some form of carbohydrate. To cover both these possibilities adequately, it would seem that, whenever intravenous injection of glucose is indicated, sufficient should be given to ensure a normal blood-sugar level for some time, even without the assistance of absorption from the stomach. Half an hour seems to us a reasonable minimum. Though less glucose would often be sufficient when the nasal feed is in the stomach, the adoption of some such routine practice is easy and should minimise the possibility of subsequent complications, especially since there may sometimes be vomiting.

TABLE I—BLOOD-SUGAR VALUES AND TIME OF AWAKENING AFTER SIMILAR COMAS (INSULIN DOSE AND COMA DURATION) AFTER INTERRUPTION BY NASAL FEEDS OF DIFFERENT VOLUMES AND PERCENTAGES OF SUGAR

Patient and data of coma	Time after nasal feed	Blood-sugar values in mg. per 100 c.cm. and time of awakening (Ax—x)		
		Nasal feed of 33 per cent. 600 c.cm.	Nasal feed of 33 per cent. 300 c.cm.	Nasal feed of 15 per cent. 600 c.cm.
N. Sept. 5 and 6. Insulin 140 units. Sopor.: 2 hr. Coma: 3 hr.–3 hr. 35 min.	0 min.	17	..	24
	5 „	29	..	39
	10 „	50	..	61
	15 „	52 Ax (15) | — x (20)	..	70 Ax (15) | — x (20)
	20 „		..	
	30 „	77	..	95
	45 „	—	..	—
	90* „	No symp.	..	..
N. August 30 and 31 and Sept. 1. Insulin 140 units. Sopor.: 2½ hr. Coma: 3½–4 hr.	0 min.	29	31	52
	15 „	— Ax (15) | 180 x (20)	—	95 Ax (15) | 160 x (20)
	30 „		152 Ax (20) | 115 x	
	45 „	125		145
	90* „	No symp.	57 (symp.)	88 (no symp.)
C. Sept. 5 and 6. Insulin 88 units. Sopor.: 3 hr. Coma: 3 hr. 20 min.–4 hr. 2 min.	0 min.	31	..	32
	5 „	48	..	47
	10 „	84	..	70
	15 „	84 Ax (15) | — x (20)	..	79 Ax (15) | 84 x (20)
	20 „		..	
	30 „	111	..	95
	45 „	—	..	—
	90* „	No symp.	..	No symp.
C. August 31 and Sept. 1 and 2. Insulin 88 units. Sopor.: 2 hr. Coma: 3½ hr.–3 hr. 55 min.	0 min.	—	29	25
	15 „	85 Ax (15)	74 Ax (15)	77 Ax (15)
	30 „	120	83	113
	45 „	180	74	134
	90* „	141	127	154
W. Sept. 5 and 6. Insulin 48 units. Sopor.: 3 hr. Coma: 3 hr. 20 min.–3 hr. 57 min.	0 min.	38	..	32
	5 „	48	..	57
	10 „	75	..	74
	15 „	101 Ax (12) | 111 x (16)	..	77 Ax (15) | 72 x
	20 „		..	
	30 „	141	..	110
	45 „	—	..	—
	90* „	..	..	..
Db. August 30 and 31 and Sept. 1. Insulin 48 units. Sopor.: 1 hr. 40 min. Coma: 3 hr.–3 hr. 50 min.	0 min.	32	43	34
	15 „	75 Ax (15) | 100 x (20)	99 Ax (15) | 72 x (20)	155 Ax (15) | 125 x (20)
	30 „			
	45 „	100	70	180
	90* „	—	113	134

* Approximately (before dinner). Symp. = symptoms.

TABLE II—INTERRUPTION BY 100 C.CM. OF 33 PER CENT. GLUCOSE GIVEN INTRAVENOUSLY WITHOUT NASAL FEED: BLOOD-SUGAR VALUES

Patient	Blood-sugar (mg. per 100 c.cm.)			
	Before interruption	Immediately after interruption	½ hr. after	¾ hr. after
G. (June 1, 1938)	..	343	106	..
PG. (June 1, „)	36	282	57 (symp. for 3 min.)	..
P. (June 1, „)	27	395	..	36 (symp. for 5 min.)

TABLE III—INTERRUPTION BY SIMULTANEOUS ADMINISTRATION OF 100 C.CM. OF 33 PER CENT. GLUCOSE INTRAVENOUSLY AND 600 C.CM. OF 33 PER CENT. SUGAR BY NASAL TUBE: BLOOD-SUGAR VALUES

Patient	Blood-sugar (mg. per 100 c.cm.)	
	Immediately after interruption	Half-hour after interruption
D. (July 5, 1938)	458	242
S. (July 5, „)	593	157
G. (July 5, „)	406	231
B. (July 5, „)	417	286

To determine the *amount of glucose necessary by intravenous injection*, another series of comas were interrupted solely by the intravenous administration of glucose after a coma of standard duration. It was found that 100 c.cm. of 33 per cent. glucose was the amount that, in these circumstances, would maintain a blood-sugar level over 100 mg. per 100 c.cm. for half an hour after its administration. The results of blood-sugar estimations on a series of patients before and at various periods after the giving of 100 c.cm. of 33 per cent. glucose without any nasal feed are shown in table II. It will be seen that immediately after the intravenous injection the blood-sugar reaches values of approximately 300 mg. per 100 c.cm., but that within 30 minutes (Patient PG.) or 45 minutes (Patient P.) it may fall to hypoglycæmic levels associated with symptoms. It is to be remembered that these patients were absorbing no sugar from the intestinal tract, and it is rare for patients to be so shocked that this happens. Table III

shows the results of a series of blood-sugars taken after interruption by combined nasal feed and 100 c.cm. of 33 per cent. glucose given intravenously at the conclusion of a normal coma of similar duration. Here, however, there was presumably less interference with the absorption from the stomach than might be expected when an interruption by intravenous injection is needed; the lowest blood-sugar half an hour after the intravenous injection was 157 mg. per 100. c.cm. (Patient S.). Table IV shows a similar series of blood-sugar estimations from some cases in which, after the usual nasal feed, 100 c.cm. of 33 per cent. glucose had later been needed and given intravenously; the indications and data of the coma for each occasion are also included in the table. It will be seen that in all cases the blood-sugar is above 150 mg. per 100 c.cm. half an hour later. Thus, 100 c.cm. of 33 per cent. glucose given intravenously is necessary to maintain the blood-sugar above hypoglycæmic levels for half an hour after the usual therapeutic comas when absorption from the stomach cannot be relied on. For the reasons mentioned above, it would therefore seem desirable to make a practice of giving this amount as a routine whenever interruption by intravenous injection is indicated.

TABLE IV—NASAL FEED (N.F.) FOLLOWED IN 30–45 MIN. BY 100 C.CM. OF 33 PER CENT. GLUCOSE INTRAVENOUSLY (I.V.): BLOOD-SUGAR VALUES

Patient and date in 1938	Time between N.F. and I.V.	Blood-sugar (mg. per 100 c.cm.)				Data of hypoglycæmia
		Near end of coma	Immediately before I.V.	Immediately after I.V.	½ hr. later	
S. (June 23)	45 min.	32	85 (*a*)	401 (*d*)	201	Insulin 60 units. Sopor. from 2nd hr. Coma from 3rd hr.
CL. (June 23)	30 „	..	87 (*a*)	398 (*d*)	241	..
W. (July 4)	30 „	37	37 (*b*)	378 (*d*)	158	Insulin 300 units. Sopor. from 1½ hr. Coma from 4–4½ hr.
G. (June 9)	20 „	36	— (*b*)	— (*d*)	172	Insulin 220 units. Sopor.: 3rd hr. Coma: 3¼–4 hr.
CI. (Mar. 30)	30 „	..	— (*c*)	— (*d*)	155	Sopor: 2 hr. 10 min. Coma: 3 hr.–3 hr. 35 min.

(*a*) Incompletely awake; (*b*) unresponsive; (*c*) incompletely rousable; (*d*) fully awake.

Sometimes the patients have still only partially recovered after the administration of 100 c.cm. of 33 per cent. glucose, and it might be considered desirable to give such patients more glucose intravenously. Further, with these and other cases, it may be desirable to give sufficient glucose intravenously to ensure that the blood-sugar remains high for about an hour. For this reason, therefore, some comas were also interrupted by intravenous injection alone, but a larger amount of glucose was administered. The results of a series of blood-sugar estimations after interruption by intravenous injection of 250 c.cm. of 33 per cent. glucose are shown in table V, which includes samples taken an hour later, before any carbohydrate had been given by mouth. It will be seen that an hour after the intravenous administration of 250 c.cm. of 33 per cent. glucose the blood-sugar will still be well above 100 mg. per 100 c.cm., even without the aid of any absorption from the stomach. But it will be seen

TABLE V—INTERRUPTION BY 250 C.CM. OF 33 PER CENT. GLUCOSE INTRAVENOUSLY, WITHOUT NASAL FEED: BLOOD-SUGAR VALUES

Patient and data of coma (1938)	Blood-sugar values (mg. per 100 c.cm.)			
	Before interruption	Immediately after interruption	1 hour after interruption	Subsequently
J. (May 26)	38	650	..	..
G. (May 26)	31	845	..	..
PG. (May 26)	32	670	..	..
P. (May 26)	34	705	..	..
D. (August 22)	34	430	125	..
S. (August 22)	39	610	228	..
Db. (Sept. 9) Insulin 56 units. Sopor. after 1¾ hr. Coma after 2¾ hr. for ¾ hr. Nothing by mouth till 2¾ hr. after interruption by intravenous injection	27	690	226 (50 min.)	75 min.–97 90 „ –50 (7 symptoms) 105 min.–39* 120 „ –36 135 „ –31

* Definite symptoms.

(Patient Db.) that the blood-sugar may begin to fall below 100 mg. per 100 c.cm. at 75 minutes and be definitely hypoglycæmic by 90 minutes, when no simultaneous absorption takes place from the stomach. Consequently, when it is necessary to maintain the blood-sugar above normal for an hour after interruption without any reliance on absorption from the stomach, 250 c.cm. of 33 per cent. glucose should be given intravenously. We have not given intravenously to any patients larger amounts of glucose than 250 c.cm. of a 33 per cent. solution, in view of the possible deleterious osmotic effects and because it seemed better to give a further injection an hour later if required.

It is reasonable to assume that a full "head" of glucose in the blood-stream would assist the recovery of cases of "irreversible" coma. But, although their non-recovery may depend partly on the persistence of tissue glycopenia despite a raised blood-sugar, there may be some disadvantage in raising the osmotic pressure of the blood to high levels. To investigate this problem, other patients, at their normal interruption time, were given, simultaneously with a nasal feed, 250 c.cm. of 33 per cent. glucose intravenously. Samples of blood were taken at the following times: immediately before and after the intravenous injection, three-quarters of an hour later, and just before the patients' tea in the afternoon (to get values quite independent of hypoglycæmia). Estimations were then made, on these samples, of blood-sugar, red blood-cell count, hæmoglobin percentage, total serum protein, and total serum chlorides. The results are shown in table VI. It will be seen that the blood-sugar rises to levels ranging from 400 to 800 mg. per 100 c.cm. A comparison of the values of the other constituents estimated in the pre-interruption samples with those of the afternoon normal samples shows the slight dehydration known to occur during hypoglycæmia. But the samples taken three-quarters of an hour after the intravenous injection of glucose show that this dehydration has not even been completely corrected. Some greater hydræmia than this should presumably occur if the high blood-sugar were producing much osmotic disturbance. Probably, therefore, it may

be assumed that little osmotic disturbance follows the intravenous administration of this amount of glucose to these cases. Hence it was concluded that 250 c.cm. of 33 per cent. glucose may be administered intravenously to terminate hypoglycæmia without any deleterious consequences arising from osmotic disturbances. Moreover, since the blood-sugar will then be above normal for at least an hour, and since this extra glucose may be beneficial to cases of "irreversible" coma, for such a condition it would seem to be a desirable routine practice. It may also be beneficial when there is much vomiting during the recovery period.

TABLE VI—INTERRUPTION BY SIMULTANEOUS NASAL FEED (600 C.CM. OF 33 PER CENT. SUGAR) AND INTRAVENOUS INJECTION OF 250 C.CM. OF 33 PER CENT. GLUCOSE: BLOOD-SUGAR VALUES, AND RED BLOOD-CELL COUNT, HÆMOGLOBIN, SERUM PROTEIN PERCENTAGE, AND SERUM CHLORIDE PERCENTAGE TO SHOW STATE OF HYDRATION. (LAST SAMPLE (3.30 P.M.) TAKEN JUST BEFORE TEA TO DETERMINE NORMAL VALUES UNCOMPLICATED BY HYPOGLYCÆMIA OR ITS INTERRUPTION.)

Patient	Estimated values of blood constituents				
	—	Before interruption	Immediately after interruption	40 min. later	3.30 P.M.
D. (July 19, 1938)	Blood-sugar*	22	405	285	104
	R.B.C.†	4,280,000	..	4,530,000	4,120,000
	Hb.‡	12·4	..	12·4	12·8
	Total protein‡	6·8	..	7·05	6·4
	Serum chlor. (as NaCl)*	647	..	641	620
B. (July 19, 1938)	Blood-sugar*	36	610	440	106
	R.B.C.†	5,190,000	..	4,470,000	4,980,000
	Hb.‡	15·3	..	11·3	15·3
	Total protein‡	7·85	..	6·1	6·3
	Serum chlor. (as NaCl)*	616	..	620	623
S. (July 19, 1938)	Blood-sugar*	31	505	330	111
	R.B.C.†	5,140,000	..	4,330,000	4,690,000
	Hb.‡	15·3	..	12·5	14·6
	Total protein‡	7·5	..	7·2	7·85
	Serum chlor. (as NaCl)*	632	..	600	590
B. (July 26, 1938)	Blood-sugar*	36	690	385	74
	R.B.C.†	4,640,000	..	4,820,000	4,510,000
	Hb.‡	14·5	..	15·0	13·5
	Total protein‡	6·8	..	7·1	7·9
	Serum chlor. (as NaCl)*	625	..	600	610
S. (July 26, 1938)	Blood-sugar*	27	575	370	108
	R.B.C.†	5,000,000	..	4,340,000	4,820,000
	Hb.‡	14·3	..	20·3	18·3
	Total protein‡	7·6	..	7·1	7·1
	Serum chlor. (as NaCl)*	615	..	595	580

* mg. per 100 c.cm.; † per c.mm.; ‡ g. per 100 c.cm.

OTHER TREATMENT

Though their pathology is still rather a problem, these cases of "irreversible" coma are benefited by other treatment, especially the administration by nasal tube of 5 per cent. carbon dioxide in oxygen and general treatment for shock, including particularly further fluid given intravenously. Apart from these considerations, until the patient is awake further sugar must also be given, either nasally or intravenously, to prevent recurrence of hypoglycæmia. As indicated above, this question arises an hour after the first intravenous injection. If there is then much evidence of shock, a further 250 c.cm. of 33 per cent. glucose should then be given, preferably with 500–1000 c.cm. of saline also. If the patient does not seem shocked, the blood-sugar should be estimated and a nasal tube passed. The gastric contents should be evacuated to ascertain how much of the previous feed has been absorbed, and then a further interruption feed should be given (600 c.cm. of 33 per cent. sugar). If a large proportion of the previous feed was withdrawn or the blood-sugar was low, it is wise to give also the intravenous injection of glucose and fluid recommended for the shocked patient. Subsequently, it is generally adequate to give similar nasal feeds at four-hourly intervals throughout the daytime, until the patient can drink. The gastric contents should be withdrawn before each feed, and if this indicates poor absorption or if the patient becomes shocked, glucose and fluid should be given intravenously in amounts similar to the previous injection. By the end of the first day most of the injected insulin will have been absorbed and the danger of recurrence of hypoglycæmia will be slight.

SUMMARY AND CONCLUSIONS

(1) For the interruption of therapeutic hypoglycæmic coma the most satisfactory nasal feed is probably 600 c.cm. of 33 per cent. sugared tea. Comparative studies on six patients were made of the recovery period after nasal feeds of 600 c.cm. of 33 per cent. sugar, 600 c.cm. of 15 per cent. sugar, and 300 c.cm. of 33 per cent. sugar. The last was slightly less effective; and, since the first two were apparently equally effective, it would seem better to give 600 c.cm. of 33 per cent. sugar, which contains the larger amount of sugar.

(2) For the interruption of therapeutic hypoglycæmic coma by intravenous injection, 100 c.cm. of 33 per cent. glucose is necessary to ensure a normal blood-sugar for a further half-hour, independent of absorption from the stomach. It is suggested, therefore, that this amount should be given as a routine whenever interruption by intravenous injection is indicated.

(3) To ensure a normal blood-sugar level for an hour after interruption of therapeutic hypoglycæmic coma by intravenous injection when absorption from the stomach cannot be relied on, 250 c.cm. of 33 per cent. glucose should be given intravenously.

(4) There is no evidence that 250 c.cm. of 33 per cent. glucose given intravenously produces significant hydræmia when given to interrupt therapeutic hypoglycæmic coma. Estimations were made of the red blood-cell count, hæmoglobin percentage, total serum protein, and total serum chloride three-quarters or an hour after this injection given simultaneously with the nasal feed and compared with normal values from the afternoon samples and those of samples before interruption from the same five patients.

(5) It is recommended that for cases of "irreversible" coma or with persistent vomiting during recovery an immediate intravenous injection of 250 c.cm. of 33 per cent. glucose should be given. Recommendations are also made concerning the subsequent administration of sugar to cases of "irreversible" coma.

In conclusion we wish to thank Prof. E. Mapother and Prof. F. L. Golla for permission to publish these results.

REFERENCES

Braunmühl, A. von (1938) Die Insulinschockbehandlung der Schizophrenie, Berlin.
Hunt, R. C., and Feldman, H. (1937) *J. Amer. med. Ass.* **109**, 1119.
James, G. B. W., Freudenberg, R., and Cannon, A. T. (1937) *Lancet*, **1**, 1101.
Müller, M. (1936) *Schweiz. med. Wschr.* **66**, 929.
Sakel, M. (1938) The Pharmacological Shock Treatment of Schizophrenia, Washington.
Wilson, I. (1936) Study of Hypoglycæmic Shock Treatment in Schizophrenia, London.

GASTRIC SECRETIONS DURING PATHOLOGICAL HYPOCHLORÆMIA

By B. M. Nicol, M.B. Aberd.
ASSISTANT IN MEDICINE, UNIVERSITY OF ABERDEEN; AND
A. Lyall, M.D. Aberd., M.R.C.P.
LECTURER IN CLINICAL CHEMISTRY IN THE UNIVERSITY

Little has been published about the composition of the gastric secretion during hypochloræmia in man. Rosemann (quoted by Soley, Lagen, and Lockhart 1938), in 1911, placed one dog on a chloride-free diet and found that the free hydrochloric acid in the gastric juice gradually diminished to zero. This observation has not been confirmed by subsequent workers.

Dragstedt and Ellis (1930), working on dogs with pouches of the entire stomach, reduced the chloride concentration of the plasma by allowing all the gastric juice to drain away and found that with plasma levels lower than one-third of normal the concentration of hydrochloric acid was little reduced.

McCance (1938) studied the effect of experimentally produced salt deficiency on the volume and composition of certain body-fluids in normal persons and found that there was a variable reduction or little change in the hydrochloric acid or total chloride content of the gastric juice. (He did not publish figures for simultaneous determinations of the plasma chloride and gastric acidity in this work.) Soley, Lagen, and Lockhart (1938) have used McCance's method to produce experimental chloride deficiency. They examined three healthy men over a period of a week on a salt-deficient diet, an increased output of salt being obtained by frequent periods of sweating. They found that no significant alteration of the free acidity or total hydrochloric acid of the gastric juice occurred under these conditions. The degree of salt deficiency attained was not high, the lowest figures for plasma chlorides in each case being 500 mg., 554 mg., and 536 mg. per 100 c.cm.

There are few references in the literature to the nature of the gastric secretions in human beings when the level of the plasma chloride is 86 mM. (500 mg. per 100 c.cm.) or less. This is probably because such reduction of the plasma chloride is difficult to attain in a normal person by the most rigorous experimental means, including deprivation of salt, sweating, and removal of gastric contents. Lower values, however, are often found in pathological states, particularly in patients suffering from pyloric stenosis accompanied by vomiting. During a study of a series of such cases in Aberdeen Royal Infirmary we had an opportunity to investigate the character of the gastric secretions when the plasma chloride had fallen to levels as low as 60 mM. (350 mg. per 100 c.cm.). The present paper contains data collected from four such cases.

CASE-RECORDS

Case 1.—A man, aged 29, was admitted to hospital complaining of epigastric pain of duodenal type, which had been present intermittently for six years. He had vomited frequently during the twelve days before admission. He was drowsy but answered questions reasonably well. He was anæmic (hæmoglobin 75 per cent.) and very dehydrated. The stomach was dilated and contained 1¼ pints of food residue and gastric juice. The benzidine reaction in the fæces was positive. Biochemical investigation showed him to be in a state of alkalosis and hypochloræmia. He did not respond well to medical treatment, and at operation severe pyloric stenosis was found. Gastro-enterostomy was performed, and he made a rapid recovery.

Case 2.—A man, aged 47, had experienced attacks of epigastric pain for eight years and had vomited occasionally for one year and daily for fourteen days before admission. He was found to have dehydration, alkalosis, and hypochloræmia, with a dilated stomach. He did not respond well to intravenous infusion of saline and to gastric lavage, and laparotomy was undertaken. Pyloric stenosis due to peptic ulcer was found and gastro-enterostomy performed, followed by a rapid recovery.

Case 3.—A woman, aged 45, had complained of epigastric pain for two years, coming on one hour after food. Pain was relieved by food and alkaline powders. She had vomited occasionally for three months and daily for six days before admission. She had been losing weight for six months and was severely dehydrated and in a condition of alkalosis and hypochloræmia. A small fixed mass was palpable in the epigastrium to the left of the middle line and tender on pressure. The gastric contents gave a positive benzidine reaction, although altered blood was not seen on naked-eye examination. Radiography revealed a large ulcer on the middle of the lesser curvature. After several days' treatment by gastric lavage and feeding on an intermediate Hurst diet, without alkalis, she began to improve, and the ulcer healed slowly.

Case 4.—A man, aged 47, had suffered for five years from epigastric pain due to duodenal ulcer. Two months before admission a radiological diagnosis of duodenal ulcer had been made. He had taken light diet and alkaline powders for three years but had shown little improvement and had been vomiting intermittently for two months before admission. When first seen he was drowsy and very dehydrated. Biochemical investigation showed him to be in a state of alkalosis and hypochloræmia. He was given intravenous infusions of a 2 per cent. solution of saline and was treated by gastric lavage and put on an intermediate Hurst diet without alkalis. Improvement was rapid, and he was discharged free of symptoms six weeks after admission.

Table I—Biochemical findings on admission in patients with peptic ulcer and hypochloræmia

Case	Plasma chloride		CO_2 combining power	Blood-urea mg.*
	mg.*	mM.		
1	350	60	124	150
2	468	80	96	76
3	365	64	138	106
4	350	60	110	94
Normal values	580	100	56	30

* mg. per 100 c.cm.

The biochemical findings in these cases on the day of admission are shown in table I.

METHOD OF INVESTIGATION

Each patient was investigated in the same manner. As soon as the hypochloræmia had been confirmed by plasma chloride estimation, the stomach was washed out with water and a fractional test-meal carried out for 2 hours. The Ryle's tube was left in position for the next 24 hours, and the patients were given a diet consisting of 5 oz. of milk every hour from 7 A.M. to 10 P.M. Samples of the gastric contents were removed hourly, those taken during the day being withdrawn just before the feeds of milk were given. Each specimen was titrated against N/10 sodium hydroxide for free and combined

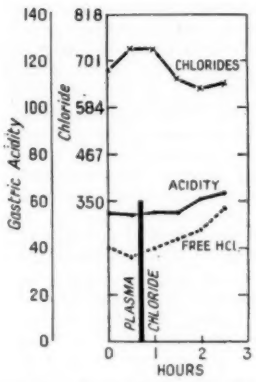


FIG. 1—Chart of findings after fractional test-meal given to Case 1.

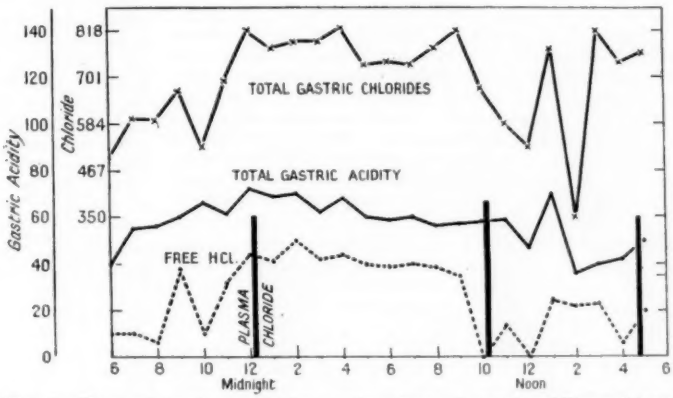


FIG. 2—Chart of continuous 24-hour estimations of gastric acidity and total gastric chlorides in severe alkalosis and hypochloræmia (Case 1).

acidity with Töpfer's reagent and phenolphthalein as indicators, and the total chlorides were estimated by Van Slyke and Sendroy's method. Oxalated blood was collected under paraffin, three samples being taken during the 24 hours, and the plasma chlorides were estimated by the same method. The average value of the three plasma-chloride readings and of the twenty-four estimations of free acidity and total gastric chloride was calculated for each 24-hour period. Similar investigations over 24 hours were carried out on several days during the patient's recovery, and the average figures are given in table II.

The chloride content of 2000 c.cm. of milk, the amount given in 24 hours to these patients, was only 2·12 g. Falconer and Lyall (1937) have estimated the basal salt requirement in health to be approximately 1–2 g., compared with the normal intake of 6–12 g. daily, and it was thought that on this low-salt intake the plasma-chloride value would not be materially increased during the 24-hour test period; this was found to be the case. Each 5 oz. of milk was estimated to contain 159 mg. chloride (as NaCl). This would make little difference to the chloride concentration of each sample of gastric juice removed.

TABLE II—AVERAGE VALUES OF CONTINUOUS 24-HOURLY DETERMINATIONS OF TOTAL GASTRIC CHLORIDES AND HCL AT VARIOUS LEVELS OF THE PLASMA CHLORIDE DURING RECOVERY FROM HYPOCHLORÆMIA

Case	Day	Plasma chloride		Gastric chloride mg.*	Free acid	Urinary chloride mg.*
		mg.*	mM.			
1	1st	350	60	628	26	10
	3rd	496	85	667	30	10
	10th	525	90	610	26	214
	11th			(gastro-enterostomy)		
	14th	526	90	635	28	310
	17th	570	98	680	34	298
2	1st	468	80	678	36	10
	7th	525	90	705	49	10
	9th			(gastro-enterostomy)		
	15th	578	99	715	43	204
3	1st	365	63	437	9	10
	3rd	452	77	450	6	20
	5th	594	101	500	8	320
	7th	584	100	568	16	210
4	1st	350	60	415	21	10
	3rd	448	77	502	29	20
	6th	555	95	447	25	246

* mg. per 100 c.cm.

RESULTS

It has not been found that severe hypochloræmia causes any alteration in the acidity or chloride concentration of the gastric content. Fig. 1 shows the chart of the fractional test-meal carried out on Case 1, when the chloride concentration of his plasma was 60 mM. (350 mg. per 100 c.cm.). Fig. 2 shows the free and combined acidity and total chloride in the same case for 24 hours immediately following the fractional test-meal, when pronounced hypochloræmia was present. The decreased concentration of free hydrochloric acid in the latter curve is due to adsorption by ingested milk. The total acidity and total chloride remained the same. Table II shows that the free acidity and total chloride concentration of the gastric juice varied little during the period of recovery from hypochloræmia in the four cases studied.

TABLE III—COMPARISON OF PLASMA CHLORIDE AND C.S.F. CHLORIDE DURING RECOVERY FROM HYPOCHLORÆMIA

Case	Day	Plasma chloride		C.S.F. chloride mg.*
		mg.*	mM.	
1	1st	350	60	570
	4th	555	95	762
	10th	525	90	—
	17th	570	98	800
3	1st	365	63	642
	3rd	452	77	704
	5th	594	101	799
	7th	584	100	788
4	1st	350	60	612
	3rd	448	77	668
	6th	555	95	745

* mg. per 100 c.cm.

The opportunity was taken to compare the chloride content of the cerebrospinal fluid (C.S.F.) with that of the plasma in these cases. The results are shown in table III. The normal chloride content of the C.S.F. is 730 mg. per 100 c.cm. The table shows that hypochloræmia is accompanied by pronounced reduction of chloride in the C.S.F. McCance (1938) showed a reduction in the chlorides of the C.S.F. in the degrees of hypochloræmia produced by experimental methods. This finding might sometimes be of assistance in the differential diagnosis between alkalosis and uræmia.

DISCUSSION

It has been shown by Soley, Lagen, and Lockhart (1938) that such diminution of the plasma chloride as could be obtained experimentally in human beings by salt restriction and sweating produced no proportional change in the gastric secretion of sodium chloride and hydrochloric acid. The figures obtained in the present investigation demonstrate that during periods of marked hypochloræmia the gastric mucosa can still secrete sodium chloride and hydrochloric acid to normal concentrations or even to levels higher than normal. This observation suggests an increased secretory activity of the gastric glands in concentrating chloride from a circulating medium much reduced in chloride content. As suggested by the work of Apperly and Crabtree (1931) and Browne and Vineberg (1932), factors other than the sodium-chloride content of the blood plasma play some part in the regulation of gastric secretion. Apperly and Crabtree demonstrated in mild experimental alkalosis in man that the total chloride and hydrochloric acid of the gastric contents varied directly with the increase in the plasma CO_2. Although the increase in plasma CO_2 in our clinical cases may have influenced the nature of the gastric secretion, we find difficulty in correlating our findings with those of Apperly and Crabtree, since these workers were not at the same time dealing with hypochloræmia or sodium deficiency. They gave ammonium chloride by mouth in one experiment and sodium acetate in another. McCance, on the other hand, under conditions which resulted in blood-sodium deficiency, could not demonstrate any major alteration in gastric secretion in man. We did not estimate blood sodium in our cases, but presumably some degree of sodium deficiency existed, since sodium chloride was lost in quantities up to 0·4 per cent. in the gastric secretion, as well as hydrochloric acid.

Our figures were obtained from patients suffering from peptic ulcer in whom hypochloræmia had been induced by vomiting. Whether the same phenomena could be demonstrated in a normal person is at present in doubt, since so far it has proved impossible to produce such extreme reduction in the plasma chloride experimentally. Besides the deprivation of chlorides and the increased output of salt by sweating, we have recently attempted to reduce the plasma-chloride level by continuous withdrawal of gastric contents. Mellinghoff and Heuschert (1934), using this method of continuous gastric aspiration, demonstrated a consequent reduction in blood volume in a series of five cases of gastric ulcer. Katsch and Mellinghoff (1933) aspirated an average of three litres of gastric contents over a period of three days in twenty cases of peptic ulcer. They removed quantities up to 33 g. NaCl and produced an average fall in the whole blood chloride of 51 mg. per 100 c.cm. The gastric secretion showed a 20 per cent. reduction in volume on the third day without significant change in the chloride concentration. We have found it possible to remove up to 30 g. of chloride daily by this means. In one patient, suffering from pyloric obstruction, true alkalosis has been produced. This was not accompanied by any appreciable change in gastric hydrochloric acid or total chlorides, even when the plasma chloride had fallen to 62 mM. (360 mg. per 100 c.cm.).

If the gastric secretory response to experimental hypochloræmia in a normal person differed from that shown in patients with peptic ulcer, it might be possible that an abnormal degree of secretory activity characterises the gastric mucosa of patients with peptic ulcer, even more fundamental than is suggested by the hyperacidity which usually accompanies this disease. Against this point of view are the findings of Dragstedt and Ellis (1930), who showed that normal secretory activity existed in the stomachs of otherwise healthy dogs in severe hypochloræmia due to the withdrawal of the entire gastric contents over several days. All the information available suggests that the gastric mucosa functions irrespectively of the economy of the body-fluids for chlorides. Reabsorption at lower levels in the alimentary tract normally compensates for this loss of chloride from the tissues. When reabsorption fails for any reason, secretion of sodium chloride and hydrochloric acid by the stomach continues, although chloride secretion by other routes, including the skin, choroid plexus, and kidney, is diminished or ceases completely. Obviously no degree of therapeutic reduction of plasma chloride can be of any avail in modifying gastric secretion.

SUMMARY

(1) Observations on the nature of the gastric secretions were made on four patients suffering from peptic ulcer and hypochloræmia. (2) During intense hypochloræmia the gastric secretion of sodium chloride and hydrochloric acid was unaltered. (3) The implications are discussed, and it is concluded that the gastric secretions cannot be modified by therapeutic reduction of plasma chloride.

We wish to express our thanks to Prof. L. S. P. Davidson and Prof. J. R. Learmonth for access to the patients investigated and for helpful criticism and advice. We also wish to thank Mr. J. M. Ellice for technical assistance, Mr. P. W. Walshe for assistance with graphs and preparation of the manuscript, and Sister Clark and the nursing staff of Ward 1, Aberdeen Royal Infirmary, for careful management of the cases studied.

REFERENCES

Apperly, F. L., and Crabtree, M. G. (1931) *J. Physiol.* **73**, 331.
Browne, J. S. L., and Vineberg, A. M. (1932) *Ibid*, **75**, 345.
Dragstedt, L. R., and Ellis, J. C. (1930) *Amer. J. Physiol.* **93**, 407.
Falconer, M. A., and Lyall, A. (1937) *Brit. med. J.* **2**, 1116.
Katsch, G., and Mellinghoff, K. (1933) *Z. klin. Med.* **123**, 390.
McCance, R. A. (1938) *J. Physiol.* **92**, 208.
Mellinghoff, K., and Heuschert, C. A. (1934) *Klin. Wschr.* **13**, 1247.
Soley, M. D., Lagen, J. B., and Lockhart, J. C. (1938) *Amer. J. med. Sci.* **196**, 88.

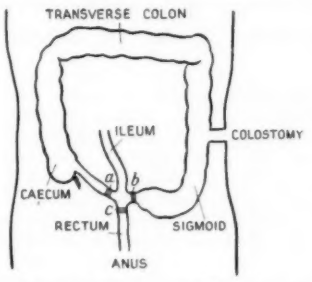
A SURGICAL PROCEDURE FOR ULCERATIVE COLITIS

BY HON. J. F. GAHA, M.B. N.U.I., D.P.H.
SURGEON TO THE ROYAL HOBART HOSPITAL AND MINISTER FOR HEALTH, TASMANIA

THE clinical course of ulcerative colitis certainly varies in different parts of the world, and in Tasmania it would seem to be more severe than elsewhere. During the last 16 years I have not heard of a successful result following any form of medical treatment in a well-established case in this country. Most cases, particularly in young women, have succumbed within four years. In consequence, we were forced to consider surgery. Ileosigmoidostomy had fallen into disrepute, yet it appeared to be the ideal operation to achieve our object of putting the affected bowel at rest, but if we were to be successful we had in addition to introduce some means of preventing reverse peristalsis.

In the last eight years we have adopted the following technique by which the affected bowel is rested in

sections. An isoperistaltic ileosigmoidostomy is done very low down in the sigmoid, the opening admitting two fingers. Heavy silkworm-gut ligatures are tied round the ileum (*a* and *b* in figure), close to the anastomosis on its distal side, and round the sigmoid on the proximal side of the anastomosis. These must be tied just tight enough to occlude the lumen. There is no danger of them cutting through. The first ligature prevents fæcal matter entering the cæcum; the second prevents reverse peristalsis carrying matter into the colon. The obstructed area between these two silkworm bands is dealt with by a colostomy (temporary type) in the descending colon. All the affected bowel, except the sigmoid and rectum, can no longer be irritated, and is put at complete rest. The colostomy allows drainage from the affected and excluded area. This drainage gradually diminishes. After a suitable interval, assessed by clinical improvement (probably at least one year), a second laparotomy is done to remove the silkworm bands, digitally dilate the bowel, and put the rectum at rest by passing a silkworm band round the sigmoid distal to the anastomoses, the previously rested portion acting entirely through the colostomy. After another interval a third laparotomy is done in which this silkworm band is removed, the sigmoid dilated, and the temporary colostomy closed and returned to the abdomen.



Scheme of ileo-sigmoidostomy. In the first operation the bowel is ligated at *a* and *b*. In the second these ligatures are removed and a ligature is applied at *c*.

The ileosigmoidostomy is not easy, owing to the necessity of making an anastomosis in an inflamed sigmoid, and stitching has to be done carefully. The second and third operations, on the other hand, are simple and short. Provided heavy silkworm-gut is used and tied only tight enough to occlude the lumen, it will not damage the bowel. I have removed a similar ligature from the pylorus which had been applied when a gastro-enterostomy was done for peptic ulcer fifteen years before.

Objections might be raised to leaving a patient with a colostomy for so long a period. Our experience is that drainage from the excluded area becomes less and less as the ulceration heals. In any event, the alternative of a permanent ileostomy has the same objection, plus the possibility of that most distressing condition excoriation of the abdominal wall. Continuity of the bowel can be retained and restored by this method of ileosigmoidostomy as soon as the inflammatory condition has subsided.

We have so far carried out this procedure in 18 cases. All are alive and able to do light work. There have been a few instances of mild recurrence, but these have easily been dealt with by medical means. The following are two typical cases from the series.

CASE 1.—An unmarried woman of 20 first seen in July, 1929. Gave a three years' history of blood and mucus in stools and pain along course of colon. Profound anæmia and emaciation; 10–12 motions with blood and mucus daily. All medical treatment failed. At laparotomy all colon found to be involved, mesentery studded with glands, bowel thickened. Ileosigmoidostomy done as described. Pad required to gather dark catarrhal seepage from colostomy. No pain. Gained 42 lb. in weight. Laparotomy 18 months later to remove ligatures. Now eight years since first operation. Can do light work. Occasional short recurrence of blood in stools, which responds to medical treatment.

CASE 2.—A man of 52. First seen in March, 1938. Gave four months' history of 12–14 motions daily with blood and mucus; extreme loss of weight; emaciation and anæmia. Medical treatment, including serum therapy, failed. Condition rapidly becoming serious. Ileosigmoidostomy done as described. All colon, and last 2 ft. of ileum, involved. Heavy discharge from colostomy, which rapidly lessened. Now two motions daily; no blood or mucus. Increase in weight 20 lb. Can do light work.

SUMMARY

The results of the medical treatment of ulcerative colitis in Tasmania are uniformly bad. A surgical technique has therefore been introduced by which the affected bowel is rested in two sections.

In a first operation an ileosigmoidostomy and colostomy are carried out and the ileum and sigmoid ligated. The ligatures are removed at a second operation and the rectum is then shut off by a ligature on the sigmoid below the anastomosis. In a third operation this ligature is removed and the colostomy closed.

In eight years 18 cases have been operated on and all are now able to do light or full work.

MINERS' DYSPNŒA

BY J. N. PETERSON, M.D. Aberd.

CECIL PROSSER RESEARCH SCHOLAR, DEPARTMENT OF TUBERCULOSIS, WELSH NATIONAL SCHOOL OF MEDICINE, CARDIFF

J. M. PETERSON, D.Sc. Aberd.

LECTURER IN EXPERIMENTAL PHYSIOLOGY, PHYSIOLOGY INSTITUTE, CARDIFF; AND

C. W. STARTUP, Ph.D. Aberd.

ASSISTANT LECTURER IN PHYSIOLOGY IN THE INSTITUTE

THE present investigation has been confined to coal-miners whose respiratory disability is such that they have had to give up their occupation. Thirty-six of these men have been examined. Beds were made available for this work by the courtesy of the Welsh National Memorial Association, and each patient was under observation for at least six days. In addition to routine clinical examination, including radiological and hæmatological examination, the patients were investigated in the following ways with a view to correlating the clinical findings with the results of quantitative measurement of any variations in their respiratory mechanism.

Each man was observed carefully while he performed a measured piece of work on a bicycle ergometer. This observation, together with measurement of the minute volume of his expired air at rest and during and after the exercise, afforded a means of determining the degree of dyspnœa.

The lung volume and its subdivisions—complemental air, supplemental air, and functional residual (supplemental plus residual) air—were measured with a Knipping spirometer, the functional residual being obtained by a modification of the method of Christie (1932). These measurements were made with a view to using the finding by Hurtado et al. (1934) and Kaltreider, Fray, and Hyde (1938) that, in emphysema at least, the vital capacity and complemental air are diminished, whereas the residual air and functional residual

air are increased, and that the respiratory incapacity can be assessed from the formula

$$\frac{\text{residual air} \times 100}{\text{total lung volume}}$$

We found, however, that the vital capacity alone, stated in cubic centimetres per square metre of body surface, could be closely correlated with the degree of dyspnœa, and we decided to use this simpler measurement.

To determine whether the change in respiration in the dyspnœic patients was reflected in the acid-base

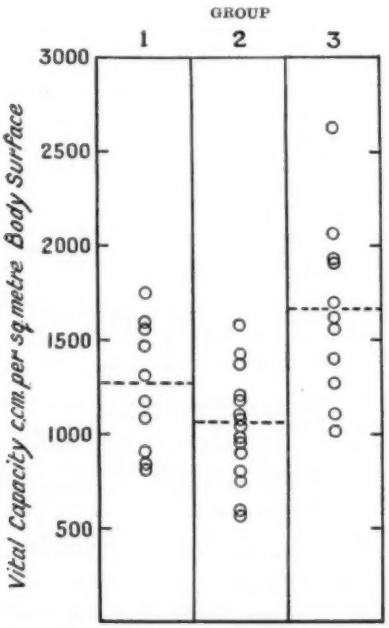


Diagram showing distribution of vital capacities in three groups of 36 coal-miners with incapacitating dyspnœa. For explanation of groups see text.

balance of the body, the titratable acidity and pH of the urine were determined after a standard meal at rest and after exercise.

FINDINGS

By radiography the patients were readily classified into three groups: group 1, those showing the "cricket-ball" type of picture described by Cummins (1936) and named type 4 in his classification; group 2, those showing pronounced lesions (mottling and reticulation) and included by Cummins in his types 1 and 2; and group 3, those showing no radiographic evidence of gross lesion but nevertheless, like the others, suffering from an incapacitating dyspnœa. Of the 36 patients examined 10 belonged to group 1, 15 to group 2, and 11 to group 3.

An examination of their vital capacities reveals that group 1 had capacities ranging from 1758 c.cm. to 850 c.cm., with an average of 1263 c.cm. per square metre of body surface; group 2 from 1599 c.cm. to 595 c.cm., with an average of 1051 c.cm.; and group 3 2694 c.cm. to 1013 c.cm., with an average of 1667 c.cm. The distribution of these figures is shown in the accompanying figure. In group 2, associated with diminished vital capacity, were the more dyspnœic and severely incapacitated patients.

GROUP 1

Average age 49, ranging from 42 to 62.
Average time spent underground 30 years, ranging from 10 to 50.
Average duration of dyspnœa 3 years, ranging from 1 to 6.

GROUP 2

Average age 50, ranging from 37 to 56.
Average time spent underground 30 years, ranging from 15 to 36.
Average duration of dyspnœa 4 years, ranging from 1 to 10.

GROUP 3

Average age 42, ranging from 20 to 56.
Average time spent underground 26 years, ranging from 4 to 38.
Average duration of dyspnœa 2 years, ranging from 3 months to 8 years.

With regard to titratable acidity of urine, the more dyspnœic patients gave lower figures than did the less dyspnœic, suggesting that the dyspnœa is probably accompanied by a change in acid-base equilibrium; but the figures are few and vary widely in each group. Without a much fuller investigation of the acid-base balance it would be valueless to speculate about the nature of the mechanism of this probable change.

Of the 10 patients in group 1 5 were receiving financial compensation, whereas of the 15 of group 2 only 1 was receiving compensation.

CONCLUSION

The respiratory damage among miners in the South Wales coal-field often causes complete incapacity for active work. In these severe cases the radiograms vary considerably. The "mottled" type is the commonest. The "cricket-ball" type is not only less common but also less often associated with the most severe dyspnœa. In about a third of all patients examined there is no definite indication of a "dust" lesion in the radiogram, and yet even some of these patients are very dyspnœic.

The degree of dyspnœa can be closely correlated with the vital capacity per unit area of body surface. The average vital capacity for the group showing "mottling" was 1051 c.cm. per square metre of body surface, and for the groups showing "cricket-ball" lesions and no definite "dust" lesions the figures were 1263 c.cm. and 1667 c.cm. respectively. We believe that the vital capacity per unit of body surface gives, in these instances, a more reliable estimate of the degree of respiratory incapacity than do the radiograms.

Further details will be furnished later, but we consider this conclusion to merit immediate publication.

SUMMARY

(1) A clinical investigation was made of 36 coal-miners with an incapacitating dyspnœa. (2) These patients were radiographically classified: 10 in group 1 ("cricket-ball" type), 15 in group 2 (mottling and reticulation), and 11 in group 3 (no radiographical evidence of gross lesion). (3) Group 1 had an average vital capacity of 1263 c.cm., group 2 1051 c.cm., and group 3 1667 c.cm., per square metre of body surface, the more dyspnœic and severely incapacitated patients thus being in group 2. (4) The degree of dyspnœa can be closely correlated with the vital capacity per square metre of body surface, which is thus a more reliable guide than the radiogram to the respiratory incapacity.

We are indebted to Prof. S. L. Cummins for inaugurating and providing facilities for this research

and to Dr. H. A. Ross and Mrs. H. Meyer for invaluable help.

Part of the expenses was defrayed by a grant from the Medical Research Council, whom we thank. One of us (J. N. P.) held the Cecil Prosser research scholarship during the period of the investigation, and we make full acknowledgment to the University of Wales for this assistance, without which the work would have been impossible.

REFERENCES

Christie, R. V. (1932) *J. clin. Invest.* **11**, 1099.
Cummins, S. L. (1936) *J. Hyg., Camb.* **36**, 547.
Hurtado, A., et al. (1934) *J. clin. Invest.* **13**, 1027.
Kaltreider, N. L., Fray, W. W., and Hyde, H. V. (1938) *Amer. Rev. Tuberc.* **37**, 662.

CLINICAL AND LABORATORY NOTES

NIGHT-BLINDNESS TREATED WITH VITAMIN A

BY CHARLES VAILLANT, B.M. Oxfd, M.R.C.P.
MEDICAL REGISTRAR AT THE ROYAL SOUTHERN HOSPITAL, LIVERPOOL; AND

LEON GILLIS, M.B. Witwatersrand, M.Ch.Orth. Lpool
CLINICAL ASSISTANT, EYE, EAR, AND THROAT INFIRMARY, LIVERPOOL

RECENT studies have shown that a high proportion of the children in the poorer-class districts suffer from night-blindness. There are also good grounds for believing that impaired adaptation is sometimes responsible for motor accidents at night. Persons with night-blindness see normally in the day-time but in the dark are at a serious disadvantage should they look at a bright light, since for a period afterwards they are unable to see at all, and this may lead to injuries to themselves or others. In a moderate case the eye responds to sudden changes from light to darkness in a period of rather more than thirty seconds, but in a severe case the vision in the dark is never adequate.

To measure the deficiency some mechanical device is required, and through the courtesy of the firm of Unilever Ltd. we were able to test our patient with their Biophotometer. Briefly, the principle is as follows: the patient looks into a light-proof eye-piece, and the eyes are exposed to a lamp of standard illumination for a given period. This causes bleaching of the retinal purple. Next, the light is switched off and in its place there appears a quincunx of five illuminated spots arranged so that there are two bright lights on one side, two dim ones on the other, and the fifth, which is of intermediate intensity, in the centre. At first the quincunx is not seen by the patient owing to the bleaching, but gradually the lights appear. The time taken by the patient to see the central intermediate light is taken as a measure of adaptation. Next, the procedure is reversed. In the first test the lights were of fixed intensity, but now they are gradually dimmed until the patient indicates that the central spot has just disappeared. The time taken from the appearance of the quincunx to the disappearance of the central spot is also taken as the measure of the adaptation-rate. The more severe the night-blindness, the longer is the time taken.

It may be argued that there must be a large error in a test like this, owing to the difficulty in deciding precisely when the lights appear or disappear, and that this error is more pronounced the oftener the test is repeated, because the patient unconsciously anticipates the end-point. In practice this does not appear to be the case, provided there is reasonable coöperation by the patient.

CASE-RECORD

The patient, Miss A aged 20, was seen at the oto-neurological clinic of the Liverpool Eye, Ear, and Throat Infirmary. She complained of inability to see at night-time, of such a degree that someone had to escort her home from her place of business each evening; she also complained that her eyes ached when exposed to bright light.

The physical examination was negative except for the presence of peripheral disseminated choroido-retinitis (which had already been noted by Dr. T. L. de Courcy, who referred her to the clinic). Further, a low percentage of free hydrochloric acid was found in the fractional test-meal. Otherwise no abnormality was found. The degree of night-blindness was measured biophotometrically on the lines described above, and it was found that the time taken for the central spot to disappear was 85 seconds, which was considerably longer than the average time (31 sec.) found in the worst of the four groups in Gridgeman and Wilkinson's series [1] of 102 healthy persons with apparently normal vision.

Vitamin A in the form of Essogen was administered. The inital dose was 10,000 international units (four capsules) daily by mouth. After two weeks of this treatment a second test was made (May 20; see table). The adaptation-rate had improved to 60 sec.

BIOPHOTOMETER READINGS IN NIGHT-BLINDNESS TREATED WITH VITAMIN A

Date in 1938	Pre-bleach readings			Post-bleach time value in seconds
	Reading	0 min.	5 min.	
		Mf.c.	Mf.c.	
May 6	Forward	0·148	0·022	
	Reverse	0·260	0·038	
	Average	0·204	0·030	85
„ 20	Forward	0·069	0·002	
	Reverse	0·216	0·002	
	Average	0·143	0·002	60
June 3	Forward	0·069	—	
	Reverse	0·022	—*	
	Average	0·045	—	22
„ 17	Forward	0·008	0·002	
	Reverse	0·069	0·002	
	Average	0·038	0·002	20

* This reading is spoilt because of the flickering of the light.
Mf.c. = millifoot-candles.

without, however, any improvement in symptoms. During the next two weeks the dosage was increased to 15,000 units daily. The adaptation-rate was now (June 3) found to have shortened still further to 22 sec., which is a normal reading. The patient found that she could see very well at night. Whereas previously she had been unable to see such objects as stars or aeroplane lights, she now found these visible to her. The pain in the eyes still persisted in bright light, and the improvement was not complete, since she found that on going out of doors from a brightly lighted room there was a brief period before she could recognise objects satisfactorily. Previously, the adaptation had been prolonged indefinitely so that she had been unable to see at all.

Dr. de Courcy re-examined her eyes and found no change in the fundi. It is hardly to be expected that

[1] Gridgeman, N. T., and Wilkinson, H., *Lancet*, 1938, **1**, 905.

any changes could occur in tissues that had degenerated over a period of at least three years, but the attempt had been made to improve the night vision, and this we feel we accomplished. Finally, an exhaustive practical test was carried out in a dark room, and we were confident that she was able to see as well and as quickly as ourselves. For the past two and a half months the patient has continued to take 5000 units daily. She feels very well, does not notice any preliminary delay in adaptation, and has complete confidence in her own ability to go about unaided.

COMMENTS

After the first fortnight of treatment, when the reading had improved to 60 sec., the patient was still as night blind as ever, and we were doubtful of the value of the biophotometer. It is significant, however, that when the night vision improved there was a marked jump in the biophotometer readings.

The early delay in responding is also interesting. After the first fortnight of treatment the patient felt no different from usual as regards either the vision or her general health. On the other hand, she was quite definite that she felt very much better in both respects after the second fortnight, during which time she had increased the daily intake of vitamin by 50 per cent.

The patient ate well, and the quality of the food was good. There were other members of the family who did not complain of difficulty in seeing; hence it seems that the fault lay in the patient rather than in the diet.

We wish to thank Dr. de Courcy for permission to report this case and for his observations on the eyes, Dr. William Johnson and Mr. P. W. Leatheart of the oto-neurological clinic for their kind interest, and Unilever Ltd. for enabling us to carry out the tests.

GAS GANGRENE

By BETTY WALKER, M.B. Lond.

HOUSE SURGEON, ELIZABETH GARRETT ANDERSON HOSPITAL, LONDON

IN the following case gas gangrene responded to an unorthodox form of treatment.

A woman of 74 was admitted to the Elizabeth Garrett Anderson Hospital for carcinoma of the right breast. The breast and axillary glands were removed, radical amputation being considered inadvisable. On the night of operation the patient became hallucinated, restless, and excitable, and tore off her dressings. Five days later the edges of the wound were inflamed and tender and there was a slight blood-stained serous discharge. Cultures were taken. Next day the temperature rose to 102° F. and the pulse-rate to 84, and the patient felt less well. The skin on either side of the wound, within a radius of 6 in. and as far down as the summit of the crest of the ilium, was œdematous and discoloured, and subcutaneous crepitations were elicited. The cultures had meanwhile produced a heavy growth of *Bacillus welchii*.

An intradermal test with 0·1 c.cm. of a 1 in 10 dilution of anti-gas-gangrene serum was carried out, and the reaction was markedly positive, but in view of the patient's general condition it was decided not to desensitise her. Similarly, opening of the wound and irrigation was not attempted. Instead the breast was treated with glycerin and ichthyol compresses four-hourly, and Omnadin (Bayer), a compound vaccine prepared from non-pathogenic bacteria and containing bile lipids and neutral fats, was injected in doses of 2 c.cm. daily for three days to stimulate resistance to infection. Radiostoleum, 4 capsules t.d.s., and ferrous sulphate, 3 grains t.d.s., were also prescribed.

The skin on either side of the middle third of the wound gradually sloughed and by the fifth day of infection there was a necrotic area, 4×2 in., with two short sinuses anteriorly and a longer one leading from the axilla. All necrotic tissue was removed and the floor of the ulcer and the sinuses were irrigated with 1 in 4000 flavine solution. Five days later, although cultures still showed *B. welchii*, the wound began to look cleaner and healthy granulation tissue began to form, while the surrounding skin was much less œdematous and discoloured. Ultra-violet irradiation was then given by Dr. H. A. Kellgren not only to the floor of the ulcer and the surrounding skin but also, by means of quartz applicators, to the sinuses themselves. The local condition rapidly improved, with the sinuses granulating well.

On the fourteenth day after treatment was begun both films and cultures were negative for *B. welchii*. The patient was discharged a week later with a small healthy granulating wound. Apart from a temperature of 102° F., and nausea on the second day of infection, she had shown no signs of toxæmia. Her appetite was good and on discharge she was looking and feeling well.

My thanks are due to Miss Morna Rawlins for her permission to report this case.

REVIEWS AND NOTICES OF BOOKS

The Emotional Factor in Visceral Disease

By H. G. MCGREGOR, M.D., M.R.C.P., medical registrar, Royal Sussex County Hospital. London: Humphrey Milford, Oxford University Press. 1938. Pp. 198. 8*s*. 6*d*.

FOR various reasons, attempts to integrate into general medicine our knowledge of the physiology and psychology of emotional states have not always been convincing. The main virtues of Dr. McGregor's book are that it is painstakingly clear, practical, and detailed in language and data; that it underlines the importance of chronicity in the emotional states which lead to physiological disturbances; and, perhaps most important, that it emphasises that acute emotional states with both psychological and physiological disturbances may pass into others in which the physiological disturbances alone are to be seen. Although this last fact is well known to all who have faced a viva with a clear head and a rapid heart or audible intestinal activity, its importance in clinical work has not always been recognised.

Dr. McGregor first describes an effective medical approach to body-mind problems through a knowledge of the physiology of emotion. Next he gives an account of experimental and clinical work on functional disturbances of the alimentary, respiratory, and cardiovascular systems, with a chapter on the autonomic-endocrine system, and finally he discusses the application of these matters to treatment. The book is illustrated throughout by case-histories largely drawn from the author's own experience. There is a profusion of detailed information on psychosomatic matters scattered throughout medical literature (to some extent it is collected in the volumes of Flanders Dunbar and Wittkower) but hitherto there has been no book to introduce the general practitioner to a subject whose importance is perhaps more obvious, and not less great, in general than in consultant practice. Dr. McGregor has necessarily limited himself to the superficial aspects of his subject. For this reason the descriptions given of the psychological characteristics of patients with hypertension

and peptic ulcer show almost as much similarity as do the abdominal outlines of pseudocyesis and pregnancy. Similarly it has not been possible to make clear the distinction between different types of anxiety state. It is, too, perhaps a matter for discussion whether the optimism expressed as to the results of simple psychotherapy by the general practitioner in functional disorders will be borne out in practice. Emotional stress, arising from current difficulties, is often to be seen as a precipitating factor in syndromes of this type. As a rule these stresses only produce abnormal bodily results because the personality of the patient is sensitised to them by a character disorder or neurosis, which must be radically dealt with in order to prevent the subsequent relapses whose avoidance must be a criterion of successful treatment. In discussing the compensatory nature of many psychological symptoms the author points out that removing such symptoms before there is real knowledge of their significance may be equivalent to giving morphia to a patient with acute abdominal pain, and one need not therefore be surprised that the results of suggestion are not uniformly successful.

For many who have been baffled in the past by the jargon of different psychological schools this book, written by a practising general physician, will provide an opening into a field of medicine where growing knowledge is likely to lead to therapeutic advances.

Whitla's Dictionary of Treatment

(8th ed.) By R. S. ALLISON, M.D., M.R.C.P., physician with charge of out-patients, Royal Victoria Hospital, Belfast; and C. A. CALVERT, M.B., F.R.C.S.I., assistant surgeon to the hospital. London: Baillière, Tindall and Cox. 1938. Pp. 1285. 30*s*.

WITH the collaboration of a team of Belfast physicians and surgeons the authors have succeeded in producing a thoroughly modern reference book on treatment from an old and respected medical classic. The book has been entirely rewritten, and although only well-tried treatments have been included we can find no serious omissions. Such conditions as bromide psychosis and biliary dyskinesia, for example, are mentioned, and so are the recent views on the treatment of anterior poliomyelitis. The book is easy to use and well indexed, with no overlap or tiresome cross-references, but it would be an advantage if references were given to the authors quoted in the text.

This is one of the best works of its kind.

Principles and Practice of Obstetrics

(7th ed.) By JOSEPH B. DELEE, A.M., M.D., emeritus professor of obstetrics and gynecology, University of Chicago. London: W. B. Saunders Co. 1938. Pp. 1211. 55*s*.

THIS standard work gives a review of the best modern American obstetric practice. The English reader should have no difficulty with unfamiliar spellings, but he must also adjust himself to a newer nomenclature. Lower-segment cæsarean becomes laparotrachelorrhaphy; accidental hæmorrhage, abruptio placentæ; the R.O.P. position becomes O.D.P. (occipito-dextra posterior); and ergometrine is called ergonovine. Different stresses are found from those in English practice, in fact the outlook is more continental than English. Uterine plugging is freely advocated, an instrument for aortic compression is illustrated, and a long paragraph is devoted to the indications for the use of the colpeurynter. Willett's forceps and treatment by intra-uterine glycerin are barely mentioned, and sulphanilamide is given a very guarded approval. Some statements are rather startling, for instance, "when Pituitary or Ergonovine is administered, which is very frequently done nowadays after the delivery of the child, the third stage is much altered" (p. 142). The differences are, however, more in the interpretation of the principles of obstetrics than in the principles themselves. As Prof. DeLee says, after describing elaborate preparations for a normal delivery, "no contrivance can be invented to take the place of an aseptic conscience." The author makes the interesting suggestion that, to be comparable with the United States, Britain and Holland should add to their mortality-rates those for their colonies, since the American "colonies" such as New Mexico, where the rate is very high, are within their borders.

The book displays evidence of an immense amount of work, every part of the subject being elaborated in great detail. Full references are given at the end of each section, and the illustrations are many and excellent. The British doctor wishing to compare obstetrics as practised in England and the United States could not do better than study this work, and in so doing will gain a wider insight into his craft.

Statistical Methods for Research Workers

(7th ed.) By R. A. FISHER, Sc.D., F.R.S., Galton professor, University of London. Edinburgh and London: Oliver and Boyd. 1938. Pp. 356. 15*s*.

Prof. Fisher's textbook was originally designed to present research workers with the modern practical statistical procedures appropriate to the data they have to handle, without entering into the underlying mathematical theory. It clearly fulfils its object and meets with a steady demand from investigators in many branches of science. With each edition extensions and improvements have been made to deal with the newer techniques. In the present issue a fuller introduction is given to the theory of orthogonal polynomials and a valuable section has been added giving an outline of the use of multiple measurements to form the best discriminant functions of which they are capable.

1938 Year Book of Radiology

Edited by CHARLES A. WATERS, M.D., associate in roentgenology, Johns Hopkins University; and IRA I. KAPLAN, M.D., director of the division of cancer department of hospitals, City of New York. Chicago: The Year Book Publishers; London: H. K. Lewis and Co. 1938. Pp. 512. 19*s*.

Dr. Waters and Dr. Kaplan, with the able assistance of Dr. W. B. Firor, have again succeeded in giving a clear idea of the progress made by radiology during the previous year. The literature in several languages has been searched for papers of special interest, and an excellent series of reproductions makes many interesting radiograms easily available. Questions of technique receive much-needed attention, and new methods are carefully discussed.

In the diagnostic section the authors consider that valuable aid may be obtained from the examination of the mamma by means of ordinary soft-tissue films, mammographs, the injection of radiopaque substances into the ducts, and aeromammography (the injection of carbon dioxide into the surrounding fatty tissue). The importance of silicosis as an industrial disease and the confusion caused by some of the rarer fungoid infections make these the subject of comment, and the use of stratigraphy or tomography and of radiokymography of the chest is well

shown. The reproductions in the sections on the alimentary and urogenital tracts show how greatly the visualisation of details of structure has improved.

In the section on radiotherapeutics most of the important papers both on the biological effects of radiation and on methods of treatment receive notice. High-voltage radiation is discussed both by physicists and by those who are trying to apply the physical findings to the treatment of patients, and the possibilities of the cyclotron are not neglected. British readers will be surprised to find that the gamma-ray röntgen is mentioned only as an experimental possibility, with no reference to published work on the practical application of dosage systems founded on this unit and in every-day use in most clinics in this country.

A Treatise on Hygiene and Public Health

With special reference to the Tropics. (9th ed.) By BIRENDRA NATH GHOSH, M.B.E., F.R.F.P.S.G., fellow of the University of Calcutta. Calcutta: Scientific Publishing Co. 1938. Pp. 720. 15*s.*

THIS excellent textbook, which was first published in 1912, has been revised and brought up to date. Considerable portions have been entirely rewritten, much new material has been introduced, and the scope of the book has been expanded by the addition of two chapters on mental hygiene. Though primarily intended for public health workers in the tropics, especially in India, it will be found useful in any part of the world, not only as a book of reference but also for practical guidance. It is a sign of the times that in the successive editions increasing consideration has been given to personal rather than environmental hygiene and particularly to problems of diet and nutrition. This is in accordance with the general shift of emphasis in modern public health work. In this edition five chapters are devoted to food questions, including one on diet in India which contains some interesting particulars not usually given in textbooks.

The book presents within a relatively small compass a large body of information in a lucid and readable form, and as examples of succinct statement special commendation may be given to the chapters on infection, animal parasites, epidemiology, and vital statistics. Errors are few, though on p. 664 the English birth-rate is said to have been 12 in 1932. The curve on the following page, which illustrates the wide variations in specific death-rates and shows an infant-mortality rate in England of 120 per 1000, is doubtless a survival from an earlier edition.

Tuberculose et tuberculides nasales

By J. MARGAROT and J. TERRACOL, professors in the faculty of medicine, Montpellier. Bordeaux: Editions Delmas. 1938. Pp. 348. Frs.60.

IN this monograph the authors describe with commendable care the lesions affecting both the outer skin and the inner mucosa of the nose. Some of these, such as lupus vulgaris and the terminal ulceration and miliary tubercle of advanced consumptives, are definitely caused by the tubercle bacillus, while others are less certainly tuberculous. The latter include lupus erythematosus, lichen scrofulosorum, papulonecrotic tuberculide, and Besnier-Boeck's disease. The authors favour the view that these affections result from embolic lodgment of tubercle bacilli in the skin, but suggest that they may be caused by unknown organisms which require for their development a soil prepared by previous tuberculous infection. They also stress the frequent coexistence of syphilis in these cases, and the importance of the patient's constitution, particularly in regard to the presence of allergy. The illustrations are good, but the summary provided in German and in English is poorly translated and marred by misprints. There is no index. Although one of a series of monographs on the ear, nose, and throat, the book will be of more interest to the dermatologist than the rhinologist.

Clinical Examination of the Nervous System

(7th ed.) By G. H. MONRAD-KROHN, M.D., F.R.C.P., professor of medicine in the Royal Frederick University, Oslo; physician-in-chief to the University Clinic for Nervous Diseases, Oslo. London: H. K. Lewis and Co. 1938. Pp. 319. 8*s.* 6*d.*

THOSE who were medical students after the war will remember a slim handbook which was their guide to the complexities of neurological examination. This has now become a more portly volume exhibiting that tendency of books to develop a middle-aged spread. The increased bulk of the book is due to Dr. Monrad-Krohn's desire to make it as complete as possible, and he now describes procedures such as ventriculography and the examination of the cerebrospinal fluid which can hardly be included in the clinical examination of the nervous system. It may be questioned whether this enlargement is really an advantage, especially to the student who needs above all that the author should select for him what is important and what is not, but the book maintains its high standard.

Dental Anatomy and Physiology

and Dental Histology. (6th ed.) By T. W. WIDDOWSON, L.D.S., consulting dental surgeon to King's College Hospital; and lecturer in dental anatomy and physiology and dental histology to King's College, University of London. London: John Bale, Sons, and Curnow. 1938. Pp. 505 and 347. Vol. I, 30*s.*; vol. II, 20*s.*

SINCE the appearance of the fifth edition in 1928 many changes have been made in this well-known book, the most important being its division into two volumes. The first volume covers histology, calcification, growth of the jaws, and the macroscopic anatomy of teeth in human beings. The second volume, which is smaller, describes the comparative anatomy of the teeth and jaws in various species of animals. This division has been made not so much because of the growth of material, though that has been considerable, but because the subject matter of the first volume changes fairly rapidly, whereas additions to our knowledge of comparative anatomy come more gradually. From the student's point of view there is an obvious advantage in being able to buy the volumes separately.

This book started as a notebook of the potted knowledge variety and has slowly expanded into a major textbook. Little of importance has escaped the author's eye, and the book is a marvel of completeness in the way in which it covers a subject which, though apparently narrow, has accumulated a vast literature. But it is more than a collection of facts; they are set out so skilfully and with such evident appreciation of their relative importance that the task of the student is lightened as far as possible. This is well seen in the chapter on calcification, where a subject of much complexity is made easily intelligible and even attractive. The style is clear and easy, the illustrations are numerous and good, and the format is convenient. It is not surprising that dental students have shown their appreciation of this book.

THE LANCET

LONDON: SATURDAY, JANUARY 21, 1939

MALIGNANT HYPERTENSION

CLIFFORD ALLBUTT recognised that a high blood-pressure can develop in the absence of renal disease. To this primary arterial hypertension he gave the name hyperpiesia; outside this country it is now usually called essential hypertension. But there are certain cases that do not at first sight fit into either of the two categories—hypertension caused by renal disease and hypertension independent of it. They are those in which the clinical course suggests a primary hypertension, but signs of renal impairment often appear and death in renal failure is common. On the assumption that these cases are examples of slowly progressive disease of the kidney they have ordinarily been labelled chronic interstitial nephritis, or nephritis repens type IV. "The difficulty of this conception," as Prof. ARTHUR ELLIS has recently pointed out, "is that though these patients may die of renal failure and show at post-mortem examination renal lesions of inflammatory type, their clinical picture is essentially that of arterial hypertension of great severity with a rapidly downhill course."[1] For this reason ELLIS and others have preferred to regard them as a variety of primary or essential hypertension, for which they use the name malignant hypertension. The lesions in the kidney they hold to be merely manifestations of the widespread vascular disorder. So far, however, this view has not won general assent; and it is here that the experimental method has once more proved its worth.

Interest in experimental hypertension was renewed some years ago when GOLDBLATT introduced an adjustable clamp whereby the renal arteries in dogs could be constricted; for it was found that in these and other mammals reduction of the blood-supply of the kidneys was followed by a persistent rise in blood-pressure. Unfortunately no close analogy between this experimental condition and malignant hypertension in man could be claimed, for there were no significant lesions in the animals' kidneys. A possible reason for this was that the kidneys were saved from the effects of hypertension by the constriction of their blood-supply; but as in dogs and rabbits in order to produce hypertension it was thought necessary to clamp both renal arteries or to clamp one artery and remove the opposite kidney, the histological effects of the high blood-pressure upon the *intact* kidney have not yet been observed. It has remained for Dr. WILSON and Dr. BYROM to unmask them in the work reported in our present issue, and the observations they have made are clearly of first importance in relation to chronic nephritis in man. It will be seen that by partial constriction of one renal artery in the rat the London Hospital investigators have been able to produce a persistent rise of blood-pressure. Some of the rats so treated have run a course resembling benign hypertension in man: they have remained in normal health; some have maintained this health as long as nine months after the operation; and those that have been killed show no histological sign of nephritis. In other rats however—probably because the artery has been more tightly clipped—the hypertension has been associated with illness; and in these the opposite, intact, kidney has shown a series of glomerular changes closely parallel with those obtained in human cases of malignant hypertension. The arterioles in this kidney and in certain extrarenal tissues have also undergone the changes characteristic of malignant hypertension—necrotising arteriolitis, fibrinoid necrosis, and so forth. Such arteriolar changes have already been described, a few months ago, by WILSON and PICKERING in the rat,[2] and by GOLDBLATT in the dog.[3] But whereas GOLDBLATT ascribed them to renal insufficiency it has been possible in the present experiments to exclude this factor.

The arteriolar and glomerular lesions in the intact kidney are attributed by WILSON and BYROM to its exposure to the full brunt of the induced hypertension; their absence in the ischæmic kidney suggests that it is protected by the clip. However this may be, it is now clear that both focal and generalised degeneration of the glomerular tuft can be caused by vascular damage alone. General recognition of the type of nephritis so produced will be of great help in analysing the lesions in chronic Bright's disease in man and in identifying genuine instances of malignant hypertension. It is to be hoped too that we are within reach of a fuller understanding of the mechanism whereby hypertension supervenes in Bright's disease, and of the vicious circle that may then ensue. The pathogenesis of this experimental hypertension is still imperfectly understood: rival hypotheses, lately discussed by PICKERING,[4] ascribe the main rôle to overaction of the vasomotor nerves on the one hand, and to a chemical or humoral factor on the other. Although certain objections stand in the way of complete acceptance of the humoral theory great importance attaches to the existence of a pressor substance, renin, in the kidney. The interaction of several factors is suggested by WILSON and BYROM, who are unwilling to attribute the lesions solely to vasoconstriction by a circulating pressor substance. They incline to think that the determining factor is a sudden strain imposed upon the vessel wall by the combination of severe vasoconstriction and a resultant rapid rise in blood-pressure. This accords with BYROM'S earlier observation[5] of somewhat similar lesions in rats after the injection of large doses of vasopressin.

[1] Ellis, A., *Lancet*, 1938, **1**, 977.

[2] Wilson, C., and Pickering, G. W., *Clin. Sci.* 1938, **3**, 343.

[3] Goldblatt, H., *J. exp. Med.* 1938, **67**, 809.

[4] Pickering, G. W., *Brit. med. J.* Jan. 7, 1939, p. 1.

[5] Byrom, F. B., *J. Path. Bact.* 1937, **45**, 1.

SURGERY IN ULCERATIVE COLITIS

THE relative value of methods of treating ulcerative colitis is obscured by the great variation in the severity of the disease. In Tasmania it seems to be particularly severe, for Dr. GAHA states in his paper on p. 146 that in 16 years he has not seen a single well-established case recover there with medical treatment. Elsewhere the mortality is quoted as from 10 to 40 per cent., and HURST [1] thinks that cases treated medically should not show a mortality of more than 5–10 per cent. Apart from the chances of death, however, even a moderately severe colitis may seriously handicap the patient for many years, and any procedure that claims to hasten recovery deserves attention.

Before HURST, SPRIGGS, BARGEN, and others advocated medical treatment in colitis surgical measures were used more readily than they are now, but there can be little doubt that they contributed to the high death-rate. At the Mayo Clinic, for instance, the postoperative mortality in the years 1927–34 was 52 per cent. Moreover, appendicostomy and cæcostomy were based on the doubtful assumption that irrigation will eliminate infection; they rarely did more than make patients more comfortable. The primary aim of surgery must be to put the affected bowel at rest by diverting the fæces, and since the rectum is usually involved this cannot be done effectively by ileosigmoidostomy alone, and an artificial stoma must be made proximal to the diseased bowel. But colostomy or ileostomy are not to be lightly embarked upon as a routine; while some patients can do without the absorptive function of the colon others cannot and fall into a severe state of malnutrition, and in the series reported by WILLARD and his colleagues [2] these operations were accompanied by an immediate mortality of 42 per cent. and a total death-rate of 72 per cent., though they were admittedly often used as a last resort. In the acute fulminating case neither medicine nor surgery has much to offer, but if medical treatment is not successful within 3–4 weeks ileostomy or appendicostomy should probably be considered. In the mild case, on the other hand, medical measures if not actually curative will generally allow the patient to live a useful life. It is in the moderately severe case, characterised by a stationary or slowly progressive course with many relapses, that surgery may be most valuable. Apart from the emergencies of perforation or massive hæmorrhage, and such definite surgical indications as stricture and pararectal abscess, MACKIE [3] urges that the decision to operate should not be made until the patient's response to medical treatment and the probable extent of permanent damage to the bowel have been completely assessed, which may take many months. His indications for surgery are failure to improve clinically, persistent progress of the lesions seen at proctoscopy, radiographic evidence of progressive fibrosis with pseudopolypoid degeneration of the mucosa, and complications attributable to chronic sepsis. JONES [4] agrees and recommends putting the patient to bed for two years if necessary, during which measures such as allergy, vaccines, serum, diet, and drugs are to be tried; but he maintains that surgery should be resorted to while the disease is still limited to the left side and there is still a possibility of doing a colostomy rather than an ileostomy. This may be followed later by extirpation of the diseased bowel, and where the whole colon is involved JONES thinks colectomy justified if the patient remains toxic and does not gain weight. In the uncommon case in which only the proximal part of the colon is diseased JONES advises early ileosigmoidostomy with subsequent removal of the affected bowel.

Dr. GAHA uses surgery as a routine. He performs an ileosigmoidostomy, shuts off the colon from the anastomosis by double ligature, and drains it by a colostomy. At a second stage, these two ligatures are removed; the intestinal contents now pass direct to the colostomy opening, while a temporary ligature below the anastomosis allows the rectum to rest. All of his patients have been able to return to light work, and such drastic surgery may well be justified where the results of medical treatment are so bad. It seems unlikely, however, that the mortality of a procedure involving three major operations will continue to be nil.

[1] Hurst, A. F., *Lancet*, 1935, **2**, 1194.
[2] Willard, J. H., Pessel, J. F., Hundley, J. W., and Bockus, H. L., *J. Amer. med. Ass.* Dec. 3, 1938, p. 2078.
[3] Mackie, T. T., *Ibid*, p. 2072.

PSYCHOTHERAPY BY LAYMEN

LAST week, as reported on another page, the National Council for Mental Hygiene discussed the lively question whether mental treatment should be practised solely by doctors. The argument in favour of psychological treatment by laymen is, it seems, largely economic. Put a little crudely, it runs like this: treatment by expert doctors is expensive, and the majority of sufferers from neuroses (of whom there are a vast number) therefore go without treatment; non-medical psychotherapists could treat them at less cost and more thoroughly, and everyone would stand to gain. The reply might be that the extent of neurotic illness is greatly exaggerated; that social adjustment and relatively simple advice suffice to prevent or treat much of it; that the advantages of psychotherapy of the ambitious time-consuming kind are by no means proved; and that the general practitioner, if he would only take the trouble, could do all that is needed for many neurotics. Here again the points are put rather crudely; some of them were set out cogently by T. A. Ross in his Morison lectures [5] three years ago. The difference of opinion, however, is real, and it may lead to very real differences of practice.

There are in fact many non-medical people—clergymen, psychologists, lay analysts—now doing psychotherapy: should we not, with Sir HENRY BRACKENBURY, be prepared to accept a fait accompli? The historical argument rightly takes account of the traditional place of the clergy as advisers, confessors, and comforters, though it

[4] Jones, T. E., *Ibid*, p. 2076.
[5] Ross, T. A., *Edinb. med. J.* 1935, **42**, 445.

maybe overlooks their record in the treatment of hysterics, obsessionals, and the grossly insane, which has seemed to lack psychological understanding. The clergy now have patients sent to them by some psychiatrists for "divine healing": this may cover a semi-miraculous or direct intervention as the result of prayer (in which case physical diseases should also be referred to them); it may consist in psychotherapy of the usual medical kind plus the help and guidance of religion; or it may be a special form of psychotherapy which emphasises moral and spiritual ends. Some may say that since non-medical psychotherapy exists it may as well be regularised and recognised; but this would apply also to Christian Scientists or other groups, and mere defeatism in this matter is not yet called for. Some may say, too: "we all practise psychotherapy, whether we mean to or not: parsons and teachers have to do so in particular; let us therefore train them properly, and not let them push on blindly or according to their inner lights." But there is a difference between casual and professional activities; between talking prose, like Maître Jourdain, and writing prose literature; and treatment of illness requires medical knowledge. The argument in favour of instructing laymen would be stronger if it was agreed to be practicable that non-medical psychotherapists should act as medical aides. Many "para-medical" groups are now recognised, including nurses, masseurs, electrotherapists, and technicians of various kinds; why not also psychotherapists? Manipulators and bonesetters are sometimes more expert than orthopædic surgeons: may not lay psychotherapists be better technicians than the psychiatrists? The answer is that physical and mental illnesses cannot be sharply separated; psychosomatic relationships, to use the modern word, have come to stay, and the psychotherapist must have a basic training in the rest of medicine. The lesson of the past is that a general medical training is needed for all specialists; the surgeons who, in SAMUEL JOHNSON's phrase, "treat by manipulative processes under the direction of the physician" acquired position and independence by way of a preliminary standard medical training. It is noteworthy that where non-medical direction has been most successful, as for instance in the early days of the Retreat mental hospital at York, medical direction has after a while taken its place. During psychotherapy symptoms and problems may arise which a non-medical person cannot recognise as significant. It is by no means rare for the physiogenic nature of a disorder gradually to become clear during psychological treatment, but the symptoms indicating this could easily be misinterpreted as psychogenic.

The recognised medical auxiliaries carry out a procedure, planned by the doctor, that is pretty well standardised; where they depart from routine, they promptly obtain sanction or direction from him. But psychological treatment is far more varied and more responsible than this: often it is unpredictable, and it is certainly not standardised. The psycho-analysts concede this: "Under the best auspices psychoanalysis must be regarded as an extremely delicate procedure, at times not free from danger to the patient, taxing all the ingenuity of the most competent analyst, who continually draws on his medical knowledge and psychiatric experience."[6] Regular discussion with the doctor, or reference of difficulties to him, would obviate this, as it does in controlled treatment by trainees; but in practice this would take too long to be satisfactory. If auxiliary medical services, whether diagnostic or therapeutic, can be defined (and we throw it out as a suggestion) as those that can be carried out with benefit and without risk to the patient, by someone not medically trained but working under a doctor's direction, psychotherapy can hardly be included among them. Psychiatric social workers, it is true, do much ancillary work; but they are in frequent, even daily, consultation with the psychiatrist, and they have specialised duties that are, technically, as little in his line as nursing is in that of the average doctor. The nearest parallel is the educational psychologist, dealing with difficult children, or the occupation-therapist. But they are not really comparable to the lay psychotherapist, who would be constantly dealing with the most intricate and important issues in people's lives.

CHANGES IN THE POISONS RULES

LAST month the Home Secretary issued various amendments of the Poisons Rules. The changes took effect from New Year's Day. Although the Home Office most properly circulated a detailed notice to the trade and other organisations affected, the law is becoming almost too complicated for the average medical man to master. A few points may perhaps be singled out for mention. Rule 7 has been altered so as to provide that a signed order for a "first schedule poison" (not being a poison within the Dangerous Drugs Acts), if given by a duly qualified medical practitioner, registered dentist, or registered veterinary surgeon, or by a hospital, infirmary, dispensary, or clinic, need not name the purpose for which the poison is required, provided that the seller is reasonably satisfied that the poison is required for medical, dental, or veterinary treatment. The highly technical rules about labelling are changed in various respects. An amendment to the sixth schedule to the rules enables the proportion of insulin in a preparation to be stated in terms of units of activity as defined in the British Pharmacopœia. Glass bottles containing local anæsthetics for injection in the treatment of human beings or animals need no longer have a fluted outer surface. Benzedrine (amphetamine) and related substances (except when contained in inhalers) are to be found in part I of the Poisons List; so are sulphanilamide and related substances. Both these groups are also brought within various schedules to the Poisons Rules. But, when contained in inhalers, benzedrine and related substances are now exempted from all control under the Pharmacy and Poisons Act or the Poisons Rules, as also are dinitrocresols in substances other than preparations for the treatment of human ailments. Lastly, by a small change in the fifth schedule to the rules, a listed seller may now sell ointments containing nitrobenzene for the treatment of animals and also photographic solutions or materials containing metallic oxalates (other than potassium quadroxalate).

[6] Oberndorf, C. P., *Psychoanal. Rev.* 1927, **14**, 281.

ANNOTATIONS

CIGARETTE-SMOKING

Dr. Segal, of Rochester, N.Y., has revived the question of the origin of the effects of smoking, this time in relation to fatigue.[1] His observations are as objective as possible and he emphasises the danger of assuming that perpetual tiredness is always due to over-smoking. Nevertheless he records definite relief after breaking the habit in several long-standing cases in which other remedies had failed; the patients gained weight and their symptoms disappeared. Everyday reports from those who stop smoking furnish no reason for doubting these findings. The heroes themselves may complain of insomnia, and their wives of their increased irritability, but these effects pass off—often, it is to be feared, because of a relapse, but naturally if given time. The increase in weight, resulting perhaps from emancipation of the palate and improved appetite, is almost universal, while the feeling of bounding vitality and missionary fervour needs no description.

There seems to be little doubt that of the multitude of vapours in cigarette smoke, nicotine is alone capable of causing systemic symptoms directly. But there is something insidious about cigarettes. They are too easily manipulated, and one becomes almost as addicted to the movements as to the tobacco. One result is excessive smoking; another is that the cigarettes cease to taste of anything in particular and often give rise to a mild but persistent irritation of the pharyngeal mucosa, most evident in the early morning. More subtle is the feeling, to which an extraordinary number of people admit, that they smoke too much—that cigarettes are a waste of money and so forth. It is not impossible that in sensitive men and women this mental conflict, together with poor appetite and local reactions to irritation, may do much to take the edge off that zest for living which is supposedly normal. It must be remembered that the symptoms of feeling "below par" are vague and subjective, and in accounting for them one must allow for vague and subjective causes and not expect to find everything explained by the definite action of a drug like nicotine.

It is for this reason that we hesitate to take for granted Segal's conclusion that, because "de-nicotinised" cigarettes and good filters failed in his experiments to abolish certain responses to cigarette-smoking, the 40 per cent. or so of nicotine remaining was necessarily responsible. The test response was the immediate increase in pulse-rate and depression of the T wave of the electrocardiogram caused by smoking half a cigarette. It appears, though it is not definitely stated, that the subjects were habitual smokers, in which case the existence of a conditioned reflex should have been excluded. It would be interesting if less than half the usual nicotine content were shown to be almost as toxic as the full quantity. It would be even more interesting if the effect on non-smokers were correspondingly reduced, while the effect on the smokers remained undiminished.

THE PLACENTA AND TOXÆMIA

THE cause of the toxæmias of pregnancy has long been notorious matter for speculation, and the fact that it remains so is a perpetual challenge. The pathological changes are so definite and the results so grave that it seems our ignorance regarding ætiology cannot last much longer. Yet one promising explanation follows another into oblivion—even the hormones have fallen short of expectations—and hope deferred begets an uncritical scepticism. In other circumstances, we might have been enthusiastic about the views of Bartholomew[1] of Atlanta. There is perhaps nothing very striking in his idea that the toxæmia may be due to absorption of breakdown products from placental infarcts, but his claim to be able to reconstruct a case of which he has no previous knowledge from an examination of the placenta, would, if sustained, amount to definite proof of a relationship. He indicates various anatomical and physiological features which make the placental vessels particularly susceptible to occlusion, and strongly maintains that the toxæmia is due to the infarcts rather than the infarcts to the toxæmia, for maternal toxæmia should affect all villi alike. Dr. Bartholomew suggests careful examination of placentæ after formol fixation by cutting into strips 0·5–1·0 cm. thick. "Grossly," he says, "the more rapid the infarction the less conspicuous the lesion, the less firm the consistency, the darker the colour and the greater the toxicity," and he describes five representative types of infarct each corresponding to a certain degree of toxæmia. In his view the relationship has not been appreciated earlier largely because the form assumed by the more acute infarcts is not generally realised. His article is worth reading for its stimulating ideas about the relation of other placental abnormalities to its vascular system, and his claims should clearly be thoroughly tested.

TREATMENT OF ASTHMA

THE annual report[2] of the clinics working under the auspices of the Asthma Research Council brings out the importance of the emotional element in the causation of asthma and its allied complaints. In children a common predisposing factor seems to be fear of losing parental affection or protection. This may explain the high proportion of asthmatics—two-thirds in the series investigated at St. Thomas's Hospital—who are only children or the eldest of a family, for the only child is subjected to constant parental demands for his good behaviour that tend to increase his fear of losing their approval, while the eldest child has the mortification of seeing himself supplanted in his parents' affections by another. An asthmatic attack often follows some frightening incident or emotional upset, and attacks are therefore common on Guy Fawkes' day, at Christmas, or in this last year during the national crisis. It is important in treating asthmatic children to impress on parents the necessity of cutting the apron-strings and encouraging their children to feel independent and self-reliant. Sometimes even the advice to let a child swim or play football is sufficient to swing the balance in his favour. Nor is this element confined to children, for the removal of a husband or wife from a too anxious partner by taking the spouse into a hospital ward is often enough to produce a dramatic cure.

The large psychological factor adds considerably to the difficulty of assessing the value of therapeutic measures. At Guy's Hospital, for instance, last year 35 cases of rhinorrhœa were treated with solutions of inhalant proteins and 14 were cured or considerably

[1] Segal, H. L., *Amer. J. med. Sci.* December, 1938, p. 851.

[1] Bartholomew, R. A., *J. Amer. med. Ass.* Dec. 17, 1938, p. 2276.

[2] A free copy of the report can be obtained from the secretary, Asthma Research Council, c/o King's College, Strand, W.C.2.

improved and 5 slightly improved. This year 32 cases were treated with normal saline only and the results were strikingly similar, 13 being cured or much improved and 6 slightly improved. Opinions differ as to the value of protein desensitisation and vaccines. At Guy's they have not been thought very successful; the results of general treatment have been at least as good. At St. Mary's, on the other hand desensitisation either by self-inoculation or a "rush" course in hospital has often been dramatically effective, and the report expresses confidence that the persistent and long-term results obtained from a two to three months' course of vaccines is due to a true immunological effect and not merely to suggestion. In order to simplify the process of desensitisation, which at present necessitates some forty injections, attempts are being made at St. Mary's to find a way of chemically altering the antigen so that the dose can be raised more rapidly without causing undue reactions. At King's College Hospital a series of asthmatics have been treated with breathing exercises, but improvement has been somewhat disappointing. At St. Thomas's, however, exercises have been found to diminish both the frequency and intensity of attacks, especially when combined with short-wave therapy, and their suggestive effect has been found especially valuable in children.

The divergent findings of these reports suggest that no accurate estimate of the value of therapy in the allergic diseases can be made without carefully controlled experiments.

HÆMOGLOBIN KATABOLISM

In 1937 Hamilton Fairley[1] described in the plasma of patients with blackwater fever a new blood pigment which he called pseudomethæmoglobin. This had previously been confused with methæmoglobin. He later demonstrated the presence of the same pigment in the plasma of patients with nocturnal hæmoglobinuria, in cases of incompatible transfusion, and in fluid from pancreatic cysts. Incubation in vitro of oxyhæmoglobin with normal plasma produces this same pigment; similarly when alkaline hæmatin is added to human plasma pseudomethæmoglobin is formed, suggesting that hæmatin is coupling with some protein or other nitrogenous constituent of the plasma. Further study of this reaction has shown that only human plasma and monkey plasma contain a constituent capable of coupling with hæmatin to form pseudomethæmoglobin; the plasma of other mammalian species is unable to do this. In association with Mr. C. Rimington, Ph.D., and Mr. R. J. Bromfield, Dr. Fairley[2] has shown that it is the albumin fraction of plasma protein that unites with the hæmatin, both the pseudoglobulin and euglobulin fractions being inactive. This union appears so firm that it probably involves chemical linkage. Fairley concludes therefore that pseudomethæmoglobin is modelled on the methæmoglobin pattern, but that while the prosthetic group is similar the protein component is native serum albumin instead of native globulin. The iron is held in the trivalent state and is even more resistant to reducing agents than methæmoglobin. In view of these findings Fairley and Rimington propose that the name of this new pigment should be changed from pseudomethæmoglobin to methæmalbumin.

Methæmalbumin is never found within the corpuscles and cannot act as a respiratory pigment. It is derived from circulating extracorpuscular hæmoglobin liberated by intravascular hæmolysis or from blood that has escaped into cysts or other cavities. During extracellular katabolism of extracorpuscular hæmoglobin, it seems, hæmatin is formed which in man and monkeys unites with albumin to form methæmalbumin, the molecular size of which renders it impermeable to the kidneys; it therefore never appears in the urine.

The importance of these observations is obvious. In the first place they throw fresh light on hæmoglobin breakdown. Secondly, the inability of serum albumin from mammals other than man and monkeys to form methæmalbumin suggests many intriguing speculations.

[1] Fairley, N. H., *Nature, Lond.* 1937, **130**, 588
[2] Fairley, *Ibid*, Dec. 31, 1938, p. 1156.

A HUNDRED YEARS

Last week the *Medical Press and Circular* joined the little band of medical journals that have survived a hundred years, and the proprietors have made the occasion more memorable by publishing a full-dress biography of the paper by Dr. R. J. Rowlette, its last Irish editor. The founder and first editor was Arthur Jacob, a distinguished anatomist and ophthalmologist, and he and Henry Maunsell who assisted him set out to make their *Dublin Medical Press*, as it then was, both a vehicle for the dissemination of Irish medical thought and a weapon to attack current abuses within and without the profession. The period was one of great activity in the Dublin school of medicine, for the classes of Graves and Stokes were attracting students from all parts. At the same time Richard Carmichael was attempting to bring the profession together in the Irish Medical Association, and Jacob and Maunsell joined him wholeheartedly in the cause of medical reform. The Irish Free State Medical Union and the Royal Medical Benevolent Fund of Ireland remain as memorials to their successful collaboration. Those were the days of red-blooded and unrestrained journalism, and Jacob was not sparing in vituperation of his opponents however eminent. He did not hesitate, for instance, to denounce by name those medical men who sought undue publicity in the public press or indulged in the practice known then as "going snacks" and now as fee-splitting. He took a leading part in the opposition to the Irish Poor Law Act, and during the great famine and typhus epidemic of 1847 onwards he turned his powerful advocacy on the fever hospitals that were often mere death-traps for doctors and patients alike.

In 1860 Arthur Jacob resigned the editorship to his son Archibald, also an ophthalmologist. Archibald Jacob lacked his father's passion for searching out abuses and he lived in times that were better mannered and more given to libel actions, so that under his guidance the paper lost something in fire but gained in dignity. In 1866 the *Dublin Medical Press* was amalgamated with the *Medical Circular*, a London fortnightly founded in the 'fifties by James Yearsley. The combined journal had separate editorial staffs in Dublin, London, and Edinburgh, with Jacob as editor-in-chief and George Ross of the *Medical Circular* under him. Although much of its contents still dealt with Irish affairs, most of the original communications now came from England. Soon after the amalgamation the name of Alfred Tindall first appeared on the title-page as publisher, and from then until his death in 1931 Tindall, as proprietor and business manager, exercised a large measure of control over the paper's policy. In 1867 the paper shed the word Dublin from its name and in the same year it became the official organ of the Irish Medical Association.

In 1901 the sixty-two-year connexion of the name of Jacob with the editorship ended with the death of Archibald Jacob, though the present-day proprietors are still members of his family. Since then, though the Irish office and supplement were retained until the new Irish Free State Medical Union decided to produce a journal of its own in 1935, the paper has become more and more English in outlook, and under the successive editorships of Jellett and Rowlette in Ireland, and Gubb, Walsh, Leonard Williams, Harry Campbell, and Cecil Wakeley in London, has steadily added to its reputation.

SYMPATHECTOMY FOR SKIN DISEASE

THE uses of sympathectomy in the treatment of skin disorders might be a profitable subject for joint discussion by surgeons and dermatologists. Prof. Telford's short paper delivered at last year's annual meeting of the British Association of Dermatology and Syphilis, which has now been printed,[1] aroused much interest but was not discussed, although there was at least one issue on which opinions would have differed—namely, the ætiology of Bazin's disease, which is still generally regarded as tuberculous in origin, but according to Telford is curable by lumbar sympathectomy. Other conditions in which, he says, preganglionic section has sometimes given good results are Raynaud's phenomenon, before supervention of sclerodactyly or necrosis, and severe hyperidrosis of palms or soles. So-called "trophic ulceration," which is really the result of injury to anæsthetic skin, is another indication for the operation, and one whose scope is by no means small when one remembers the various nervous diseases that cause prolonged or permanent loss of cutaneous sensation. The operation of sympathectomy, Prof. Telford concludes, is still on trial, but "may prove of lasting benefit in selected cases of certain diseases of the skin and subcutaneous tissues."

CELSUS DE MEDICINA

WHO Celsus was and exactly when he lived is uncertain, but we know that he wrote in the first half of the first century A.D. and, on the authority of Quintilian, compiled works on numerous subjects other than medicine. Some authorities have therefore considered him to have been an encyclopædist, a compiler of popular treatises on law, military strategy, agriculture, philosophy, and rhetoric, for Quintilian tells us that he left volumes on all of these, and incidentally calls him a man of mediocre talent for all that. Some modern scholars, among them Marx, whose opinion has great weight, have thought that in his "De Medicina" Celsus simply translated into Latin an earlier Greek treatise on medicine. Mr. W. G. Spencer, who has now completed his translation of this work,[2] holds a contrary view, and many passages and expressions in the text certainly convey the impression that Celsus was a practising physician. Encyclopædic knowledge was a characteristic of the learned men of the period. The philosopher Favorinus, who lived a century later, was also an authority on grammar, archæology, and medicine, and Aulus Gellius has left an account of the visit the philosopher Taurus paid him when he was sick with a fever, and of the discourse of Taurus on the clinical lessons to be derived from a study of the arteries and veins. So there is no inherent improbability in the fact that a learned physician should have been accepted as an authority on a multiplicity of subjects.

Where the text is sound—and the scholarship of Marx has solved many of the translator's difficulties—there is no substantial obscurity in Celsus. He wrote in a Latin of the best classical period, in well-ordered sentences, and in clear and precise phraseology. Mr. Spencer succeeds in conveying the author's meaning faithfully in nervous and rhythmical prose, though one may quarrel with his monotonous iteration of certain conjunctions, which though native to Latin are less common in the best English. Mr. Spencer has compiled a list of the drugs that Celsus mentions and has used his specialist learning in an attempt to identify them. Some are well known and in use today, others are doubtful, and a few are completely unidentifiable. But the list brings home to us how the Rome of the first century drew on the whole world for its imports. Costus, for instance, was made from the roots of "Saussurea lappa, a plant of Kashmir," a region which Cæsar never knew. Zingiber too was familiar to the Romans and came from the more distant east. On the whole a reperusal of the "De Medicina" leaves us with an increased admiration for the sum of medical attainment in the first century, for the soundness of received opinion and the rejection of charlatanism, and the freedom from the cruder superstitions which were later to obsess the healing art.

SIGNIFICANCE OF PAIN IN CARDIAC INFARCTION

THE theory that angina is the result of myocardial ischæmia, which leads to the accumulation of metabolites capable of stimulating afferent nerves, has been generally accepted; but it is hard to explain in this way the existence of extensive coronary sclerosis without symptoms and the occurrence of cardiac infarction without pain. The pain of cardiac infarction may certainly be less, and may perhaps even be absent, where the central nervous system is comparatively insensitive, and Boyd and Werblow[1] suggest that there may sometimes have been a previous infarction near by that so damaged the cardiac nerves as to make the area insensitive.

Recently Gorham and Martin[2] have revived the old idea of vascular tension as the origin of cardiac pain. Of 100 cases of coronary occlusion that they studied at autopsy, 42 had not had cardiac pain in their fatal attack. It was found that the patients who had no pain were older than the rest, their predominant symptom had usually been dyspnœa, and they had less often given a history of previous attacks. Furthermore, in the pain-free group a pericardial rub had less often been heard, and at autopsy these cases showed less of the milder grades of coronary sclerosis and more old infarcts. The situation of the infarct and the frequency of ventricular rupture were not significantly different in the two groups. Pain had always been a symptom wherever acute infarction and actual thrombosis in the coronary artery were found, whereas it was absent or a secondary symptom in all but one case in a group with coronary narrowing and old infarction but no thrombosis.

The authors suggest that tension on the coronary artery proximal to an obstruction can cause pain, and that it is most likely to arise in this way when

[1] Telford, E. D., *Brit. J. Derm. Syph.* December, 1938, p. 637.

[2] Celsus *De Medicina*. Vols. II and III. Translated by W. G. Spencer, M.S. Lond., F.R.C.S. London: William Heinemann. 1938. Pp. 449. 10s. per volume.

[1] Boyd, L. J., and Werblow, S. C., *Amer. J. med. Sci.* 1937, **194**, 814.

[2] Gorham, L. W., and Martin, S. J., *Arch. intern. Med.* November, 1938, p. 821.

a thrombosis occurs in an artery which previously had a relatively good channel and whose wall remains elastic and contains healthy nerve-fibres. In dogs they found [3] that tension on the wall of the coronary artery by traction on threads passed through the adventitia in such a way as not to obstruct the circulation readily produced symptoms which were interpreted as indicating pain. Similar symptoms were produced less readily by a ligature which occluded the artery. After ligation the electrocardiogram showed changes indicating ischæmia, but the tension experiment was without effect on the tracing. These arguments are, however, not convincing, for the absence of pain in infarction seems just as explicable on the condition of the artery and myocardium distal to an obstruction as on the state of the artery proximal to it, and the animal experiments demonstrated only that traction on the perivascular nerves is capable of producing pain. Nevertheless the findings are important, and it may yet be proved that vascular tension is one of the factors that modify the symptoms of myocardial ischæmia.

THE G.M.C. UNDER FIRE

THIS is still a country where authority can be challenged. The General Medical Council, challenged not for the first time, is vigorously attacked in a memorandum issued by the Medical Practitioners' Union. The General Medical Council's members are too old; they are out of touch with the body of general practitioners; the wrong representatives are chosen. The council, as at present constituted, cannot possibly perform the simultaneous functions of supervising medical education and enforcing professional discipline. An independent commission should review the scope of medical education before and after qualification. The prospective practitioner should be taught the "socio-political responsibilities inseparable from medical practice." The commission should arrange for "only one portal of entry into the profession"; the multiplicity of universities and other corporate bodies which at present conduct qualifications must give way to a single standard of qualification; the existing diversity means that some qualifications are greatly superior to others; independent inquiry might well show that the lowest standards are really too low. The G.M.C. is letting in alien doctors to the prejudice of practitioners born and educated in this country. As for discipline, the council's functions ought to be surrendered to an entirely new body whose members should be more than half composed of directly elected registered medical practitioners, no member to be a day older than 65. This new tribunal is to have not only the traditional jurisdiction over the proper conduct of professional men entrusted to the G.M.C. under the Medical Act eighty years ago, but also the disciplinary powers of the Ministry of Health arising out of the contractual relationship entered into by doctors who undertake health insurance work. From the decisions of this new tribunal there is to be a right of appeal (presumably to the High Court) on an almost unprecedentedly wide front—both on questions of law and on issues of fact and also by way of rehearing. Such are some of the points in the memorandum.

There is nothing good or bad, said Shakespeare, but thinking makes it so. The Medical Practitioners' Union has done plenty of thinking; the resultant criticism is a healthy process from which the G.M.C. will not claim to be immune. Some of the imperfections, if found to be of substance, could be remedied without revolution. The choice of younger men and the retirement of the too mature could be achieved by voluntary effort. The Privy Council could use its existing authority to prevent the abuse of a system of sub-standard qualifications. A complaint that the professional rules against canvassing and advertisement are infringed with impunity by eminent persons could be met by action (open to members of the M.P.U. itself) to enforce the rules. For the rest the criticisms must be examined on their merits. The justice dispensed by the G.M.C. upon applications to remove a name from the register is scarcely so perverted as the memorandum might suggest. Many years ago Lord Justice Fry paid tribute to the statutory process of "due inquiry" under the Medical Act. In spite of the union's inevitable reference to one famous case of the professional association between registered and unregistered practitioners, after which "an eminent manipulative surgeon was honoured by the King with the accolade of knighthood," it has yet to be shown that the disciplinary work of the council has forfeited confidence since the Lord Justice spoke. The memorandum observes more than once that the G.M.C. exercises its disciplinary jurisdiction on behalf of the state. Parliament delegated to the council the duty of formulating the standard of professional ethics and of maintaining that register which would enable the public to distinguish between qualified and unqualified men. The method of removing a name is not greatly different from the method by which the benchers of the Inns of Court, a far less democratically constituted body than the G.M.C., inflict an even greater penalty upon the delinquent barrister. Those who incur that penalty may have their grievance; but among the doctors as among the barristers there is probably a general preference for a tribunal composed of members of the profession rather than for another court. The jurisdiction of the Minister of Health in administering the National Health Insurance Acts is not likely—since public money is involved—to be handed over to a new body. Panel work is a non-compulsory part of a state medical service and some of the M.P.U.'s criticisms seem more likely to be met if and when all medical practice is organised directly under the state. This is not to say that no improvement is possible in the constitution and functions of the G.M.C. To stop criticism, as Voltaire observed, one must die. The council is not dead yet.

THE ÆTIOLOGY OF PROSTATIC ADENOMATA

FROM time to time we have referred to evidence that stimulation by œstrogens is responsible for benign enlargement of the prostate. The hypothesis is founded on the observation—independently made in France by Lacassagne, in Holland by de Jongh, and in England by Harold Burrows—that the prostate of mice enlarges under œstrogenic stimulation. Corresponding observations have since been made on other mammals, including monkeys, and the details of the hypothesis have now been formulated in such a way as to take into account the specific anatomical differences between the rodent and the human prostate.

Cunéo [1] has developed the view that enlargement of the prostate is one of several signs of a relative increase in œstrogenic stimulation which results from a "senile" decrease in the production of male hormone. He also postulates that the condition is essentially a hyperplasia of the uterus masculinus—

[3] Gorham and Martin, *Ibid*, p. 840.

[1] Cunéo, B., *Bull. Acad. méd. Paris*, 1936, **116**, 434.

an idea first put forward by Zuckerman and Parkes,[2] on the basis of experiments with monkeys. The somewhat indirect evidence that he has brought to bear on it is derived mainly from a study of the morbid anatomy of the condition, and concerns the topographical relation of the adenomatous growths to the true prostatic glandular tissue which in essential structure they resemble. It is of interest that in arriving at this point of view he abandoned the hypothesis that the process of adenomatous enlargement begins in the glands of Albarran—a hypothesis for which he was partly responsible and one which has always conflicted with the fact that these glands may be normal in appearance in cases of prostatic enlargement. Despite their suggestive nature, Cunéo's arguments have failed to convince some of his French colleagues. Barres,[3] for example, argues that a senile decrease in the production of male hormone is by itself insufficient to account for prostatic adenomata. He points out that the malady is almost unknown in one race, the Tonkinese, and he thinks that inflammation plays an important part in its development. Cunéo's views have also been vigorously attacked by Marion,[4] partly because of their lack of experimental support and partly because the disposition of adenomata in the prostate, according to Marion, not infrequently suggests that they do not arise in the glands of the utriculus. Marion also points out that in the operation of prostatectomy the utricle or verumontanum is removed. In deciding between the arguments of these two distinguished authorities it is difficult to avoid the conviction, which indeed is stated by Marion, that the site of origin of benign hypertrophy of the prostate is unlikely to be decided by simple pathological and histological study. As Marion himself writes, such study can never show whether adenomata arise in the glands of the verumontanum or in those of the neck of the bladder.

In the circumstances it is useful to refer to experimental observations since reported by Zuckerman.[5] A study of the prostates of normal rhesus monkeys and those of monkeys injected for prolonged periods with œstrone showed that the growth that such treatment stimulates is restricted mainly to the region which in human anatomy is referred to as the middle lobe. The area occupied by the true prostatic glands does not increase significantly, and as a result of the hypertrophy of the middle lobe the prostatic glands are displaced dorsolaterally until they come to form a false capsule to the organ. The hypertrophy of the middle lobe is due mainly to development of its fibromuscular tissue, although hyperplasia and metaplasia of the "uterus masculinus" also play a part. The lining of the uterus masculinus in the species used in these experiments responds like vaginal epithelium. It would therefore be of interest if similar experiments were performed on a monkey whose uterus masculinus was indeed homologous with the uterus.

SPAIN

SOME of our readers may wish to be reminded of addresses to which they can send help for children and refugees in Spain. The National Joint Committee for Spanish Relief have their headquarters at 4, Great Smith Street, London, S.W.1, but gifts of clothes should go to them at 15, Great James Street, W.C.1. The Spanish Medical Aid Committee have sent by air some morphine, chloroform, and compressed dressings, and are arranging for two lorry-loads of further supplies to leave England before this week-end. More money is needed if these lorries are to be filled, and subscriptions will be welcomed at 24, New Oxford Street, W.C.1. The committee have received a telegram from Dr. Audrey Russell saying that refugees are streaming into Barcelona, where babies are already rationed at 250 grammes of milk and 100 grammes of sugar weekly. It will be impossible to provide for the new influx unless more supplies are sent immediately. "Please send every ounce possible milk and sugar also increased effort to supply surgical dressings anæsthetics ambulances to deal with terrible slaughter at front." . . . "The heart of mankind," she adds, "must be made of stone to let this happen."

[2] See Zuckerman, S., *Lancet*, 1936, **1**, 135.
[3] Le Roy des Barres, A., *Bull. Acad. méd. Paris*, 1937, **117**, 367.
[4] Marion, *Ibid*, p. 124.
[5] Zuckerman, S., *J. Anat.* 1938, **72**, 264.

Colonel A. M. JOHNSON, M.C., T.D., assistant director of medical services, 42nd (East Lancashire Division, Territorial Army, was created a commander in the Order of the British Empire in the New Year honours list.

Group-Captain F. C. COWTAN, principal medical officer in the Middle East Command, has been promoted to the rank of air-commodore. Group-Captain Cowtan is the fourth who holds this rank in the medical branch of the Royal Air Force.

Lieut.-General Sir HAROLD FAWCUS has resigned from the office of director-general of the British Red Cross Society.

FOLK-LORE AND MEDICINE

AT a meeting of the West London Medico-Chirurgical Society on Jan. 13, with Dr. Maurice Shaw, the president, in the chair, Dr. J. D. Rolleston read a paper on folk-lore and medicine. He said that since the publication in 1927 of the late Dr. Dan McKenzie's work, "The Infancy of Medicine," the subject of folk-lore in connexion with medicine had attracted little attention in this country. This lack of interest was in marked contrast with the enthusiasm that it had provoked on the Continent, especially in Balkan countries, representatives of which had contributed several learned papers to the last three congresses of the International Society of the History of Medicine held at Bucharest in 1932, Madrid in 1935, and Zagreb and Belgrade in 1938. The various prophylactic and therapeutic measures in folk-lore medicine, in which the curative methods far outnumbered the preventive, could be ranged under one or more of the following headings: (1) Transference of the disease to other persons, animals, or inanimate objects. (2) Animal, plant, or mineral remedies. (3) Religious influences, including the invocation of special saints. (4) The healing power attributed to water in the form of wells, springs, fountains, and streams. (5) The mystical power of odd numbers. (6) Repellent and disgusting remedies, including coprotherapy, for the purpose of drawing out the evil spirit who was supposed to be the cause of the disease. (7) Miscellaneous causes, such as the doctrine of signatures, constriction by rings, charms connected with death or the grave, &c. The diseases and symptoms for which the largest number of folk-lore remedies and preventive methods had been applied were whooping-cough, ague (which included not only malaria but, as its etymology indicated, any acute fever), epilepsy and convulsions of any kind, rheumatism, consumption, eye diseases, skin diseases (especially warts), cattle diseases, headache, toothache, jaundice, hæmorrhages of any kind, and bites of snakes and scorpions. After giving numerous examples of folk-lore medicine in whooping-cough, epilepsy, rheumatism, and jaundice, Dr. Rolleston concluded by saying that though many folk-lore remedies had become obsolete some were still practised not only by the inhabitants of remote country districts but also by educated persons in business centres.

SPECIAL ARTICLES

EPIDEMIC JAUNDICE: A HOSPITAL OUTBREAK

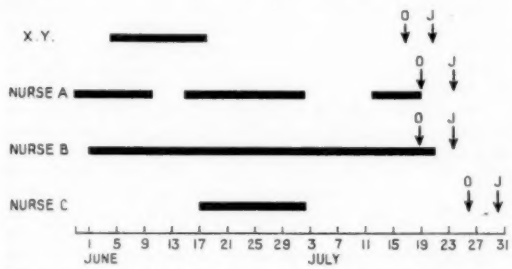
By E. Marjorie Martland, M.A.Camb., M.B. Lond.
DIRECTOR OF THE PATHOLOGICAL LABORATORIES, ELIZABETH GARRETT ANDERSON HOSPITAL; AND
Albertine L. Winner, M.D. Lond., M.R.C.P.
HONORARY ASSISTANT PHYSICIAN TO THE HOSPITAL

THE whole question of epidemic jaundice has been reviewed so fully in recent years that one may perhaps feel that there is little to add in our present stage of knowledge. We record this small outbreak partly because it resembles so closely in incidence, incubation-period, and course those described by Booth and Okell (1927-28), Barber (1937), Wallgren (1936), and others, and because it differs from these, as far as we can make out, in respect of a complication not previously noted.

CASE-RECORDS

Our cases include a child and three nurses who became ill between July 17 and 26, 1937, all of whom had been in the children's ward of the Elizabeth Garrett Anderson Hospital at some time between June 4 and 18. We report the cases in full.

X.Y., a child aged 6, was admitted to the children's ward on June 4 under Miss Winifred Hall for tonsillectomy. Her general condition was very poor, and operation was postponed until this was better. On June 18 she was sent to the hospital's home of recovery at Barnet, where she remained with considerable improvement. On July 17 she vomited and had a temperature of 102° F., on the 18th she again vomited and the temperature was 99° F., and on the same day she was seen by A. L. W., when the temperature was normal, the throat was somewhat injected, and otherwise there were no abnormal physical signs. She continued to vomit, and on the 21st her stools were clay-coloured and she became



Periods spent in children's ward related to onset of illness.
O=onset of illness. J=onset of jaundice.

slightly jaundiced. The jaundice persisted until the 25th, when it began to fade, but the stools remained pale and the urine contained much bile until July 27, after which convalescence was uneventful. The only blood-count was done before the jaundice on June 6 and was normal; the Wassermann reaction was negative; a throat-swab on July 24 showed hæmolytic streptococci, and these were still present on Sept. 9, when the child returned from Barnet for tonsillectomy. This was done on Sept. 18, and the child was finally discharged on Sept. 24.

Nurse A was in the children's ward intermittently from May 11 till July 19 (see figure). She was taken ill in the night with severe vomiting, headache, and generalised abdominal pain and was admitted to the ward on July 19. The only relevant fact in her past history was that she had had an appendix abscess drained at the age of 14. On admission the temperature was 100·8° F., pulse-rate 115, tongue furred, breath offensive, and throat injected, heart and lungs were normal, and the abdomen showed epigastric tenderness with guarding. She was seen by a surgeon who did not consider the case one for operation. The throat-swab grew hæmolytic streptococci, and the blood already showed a leucopenia (see table). During

LEUCOCYTE COUNTS IN NURSES A, B, AND C

Case	Date (1937)	W.B.C.	Polymorphs (%)	Lymphocytes (%)	Hyaline (%)	Large mononuclears (%)	Remarks
A	July 19	5900	..	..	..	..	..
	„ 20	3200	..	..	..	..	..
	„ 22	2900	44	32	4	10	..
	„ 23	..	50	44	2	4	Jaundice next day
	„ 28	3700	..	..	..	..	..
	Aug. 5	6000	..	..	..	..	..
	„ 13	6600	..	..	..	..	Oöphoritis starting
	„ 16	9800	..	..	..	..	..
	„ 17	8400	..	..	..	..	Oöphoritis subsiding
	„ 20	9200	..	..	..	..	Return of oöphoritis
	„ 27	11,200	..	..	..	..	..
B	July 28	3100	64	32	1	2	4 days after jaundice
C	..	4300	57	41	0	0	..

the next few days her condition deteriorated rapidly; abdominal pain and vomiting were severe, and she became drowsy, cyanosed, and delirious, her appearance strongly suggesting typhoid. The leucocyte count continued to fall, but all other investigations were negative; blood-culture taken on July 21 remained sterile, the Widal reaction was negative on July 23, the urine grew a few *B. coli* only, and the stool showed no abnormal organisms. On July 22 her spleen became palpable and very tender, and on the 23rd the van den Bergh test showed a weak direct and strong indirect positive reaction. On the 24th her condition began to improve, and that evening the conjunctivæ became jaundiced. Next day she seemed much better, although jaundice was obvious and there was bile in the urine; the liver was tender though not enlarged and became palpable two days later. On the 27th blood-films were negative for the *Leptospira icterohæmorrhagica*, as also were the urine and serum examined by Dr. J. M. Alston. Dr. S. D. Elliott investigated throat-washings and blood for viruses by animal inoculation with negative results.

From this time her jaundice gradually faded and her general condition was quite satisfactory. But about Aug. 10 her temperature, which had completely settled, began to rise to 99° F. in the evening, and there was some return of pain with tenderness, this time in the right iliac fossa. By the 14th the evening temperature was 100° F., and she was having considerable pain. Miss E. Bolton, who saw her in consultation, found tenderness and guarding in the right iliac fossa; examination per rectum showed that the uterus was forward and very tender; there was tenderness in the right fornix; and the right ovary, not definitely felt, was probably inflamed and attached to the appendicectomy scar. A menstrual period was about due, and a diagnosis of oöphoritis was made. The leucocyte count, which on the 5th was 6000 and on the 13th 6600, had risen by the 16th to 9800. The pain and nocturnal temperature persisted and then gradually subsided; the leucocyte count rose gradually to 11,200. On the 27th the much delayed period made its appearance, but two

days later she had another attack of pain in the right iliac fossa with vomiting and an evening temperature of 100° F., whereupon the period stopped abruptly. After this her convalescence was uneventful, and she was discharged on Sept. 14.

Nurse B was in the children's ward from June 1 to July 21, 1937. She reported sick on July 21 with a two-day history of headache, pains in the limbs, and malaise. On admission her temperature was 100·8° F. and pulse-rate 98, and she was obviously ill. No abnormal physical signs were found in heart, lungs, or abdomen. The tongue was moist, throat normal, and urine normal. On the 22nd her temperature was 98·6° F. and she was much better, but on the 23rd, though the temperature was now normal, she was having considerable nausea and vomiting with coryza. The next day her throat-swab grew hæmolytic streptococci and staphylococci, and on the evening of that day, the sixth of her illness, she became definitely jaundiced; simultaneously her nausea improved and bile appeared in the urine, but her stools remained normal in colour. On the 28th she was still yellow and had considerable pruritus but was otherwise symptom-free. The leucocyte count showed 3100 white cells per c.mm. with polymorphs 64 per cent., lymphocytes 32 per cent., large mononuclears 2 per cent., hyalines 1 per cent., and basophils 1 per cent. The jaundice disappeared in the course of the next few days, and recovery was uneventful, but on Aug. 4 the throat-swab still showed hæmolytic streptococci.

Nurse C was in the children's ward from June 17 to July 2 and was then sent to the home of recovery at Barnet for duty. On July 26 she had some nausea, vomiting, and loss of appetite, and on July 29 her stools became clay-coloured and she developed jaundice. She was transferred directly to the North Western Fever Hospital on July 30, and on admission it was noted that her skin and sclerotics were definitely icteric. The jaundice gradually faded and had completely disappeared nine days after admission. She was afebrile throughout her stay in hospital. The van den Bergh test gave a weak direct positive and a definite indirect positive reaction. A leucocyte count showed 4300 cells: polymorphs 57 per cent., lymphocytes 41 per cent., and eosinophils 2 per cent. Convalescence was uneventful, and she was discharged on Aug. 18.

DISCUSSION

The points of interest seem to be as follows:—

Source of infection.—During June the three nurses were on duty for periods varying from fourteen to thirty days in the ward where the child X.Y. was a patient. This children's ward was the only point of contact of these four people, and it seems reasonable to assume that the source of infection was located there. The onset of illness of three of the cases within two days, July 17 and 19, suggests a single origin. A scrupulous search through the cases in that ward at the relevant time has been negative; no trace can be found of any attack of pyrexia, tonsillitis, or enteritis, nor did any other child show signs of jaundice. The child X.Y. was not kept in bed but was running about the ward; so no help can be got from the position of her bed. Several children had hæmolytic streptococci in their throats, as had the four cases; but that is so usual that it was not thought significant. All the nursing staff attached to the children's ward were affected except the sister; both she and the resident staff were healthy and have remained so since. The food in that ward comes from the general kitchens. In short, every effort to find a common focus of infection has failed. Here we may note that in September, 1934, two nurses in this ward became ill with pyrexia and general malaise, followed by jaundice and accompanied by leucopenia. It is not easy to see how the same cause could operate, no cases having appeared in an interval of nearly three years, but we record the curious fact for whatever it may be worth.

Incubation period.—The removal of the child X.Y. from the hospital on June 18 seems to fix the incubation period at not less than twenty-nine and not more than forty-three days, assuming the children's ward to contain the source of infection. On the same hypothesis, the period on duty in that ward of Nurse C from June 17 to July 2 and her subsequent transference to the home of recovery till her illness on July 26 place the probable incubation period in her case at twenty-four to thirty-nine days. This agrees with the conclusion reached from the epidemics reported by Findlay, Dunlop, and Brown (1931), Pickles (1930), and others, in which the incubation period was three to five weeks.

Ætiology.—Here again we have to admit failure. Cultures of blood, urine, and fæces remained sterile, and animal inoculations with serum and with throat-washings from Nurses A and B were all negative. The presence of hæmolytic streptococci in three cases out of four was disregarded, because this organism is found so frequently in routine examination of throat-swabs, but it is worth noting that Frazer (1935) found that sore-throats preceded jaundice in all the twenty-five children in the epidemic he describes. Dr. Alston's examinations of urine and of serum for the leptospira of Weil's disease were also negative.

Differential diagnosis.—The symptoms common to the cases were nausea and vomiting, with jaundice appearing four or five days after the onset. These are the classical symptoms of the clinical entity recognised as infective hepatic jaundice. We would point out how easily the common features can be obscured until the jaundice becomes apparent. Nurse A, with acute abdominal pain and tenderness and severe toxæmia, gave the picture of virulent typhoid; Nurse B, with mild pyrexia, aching limbs, and coryza, ran some risk of being deemed "gastric influenza," and it was not till the jaundice appeared that any relation was obvious between the two. The consistently negative reports of the bacteriologist are helpful in differentiating this disease from those of the typhoid group and from leptospiral jaundice. Some slight help in early diagnosis can be found in the leucopenia, which may be one of the first signs. Nurse A showed this within twenty-four hours of first feeling ill, and by the fourth day the leucopenia and monocytosis were well marked, though jaundice had not yet appeared. Not till the onset of oöphoritis three weeks later, after a period of convalescence, did the leucocyte count cease to be slightly subnormal. It may perhaps be useful to emphasise here the great value of the leucocyte count in differential diagnosis once the jaundice is established. In Weil's disease there is, as a rule, a polymorphonuclear leucocytosis of above 13,000—often much higher—whereas in infective hepatic jaundice the white-cell count is usually below 8000 and may be as low as 2000 with either a relative lymphocytosis or a monocytosis or both. Our observations do not seem to throw any light on the question of the distinction between the catarrhal and hepatic forms of epidemic jaundice.

Oöphoritis.—Complications appear to be unusual in infective hepatic jaundice. Oöphoritis does not seem to have been recorded before, though it is interesting to note that Cockayne (1912–13), in his original description of the disease, draws a parallel on quite other grounds between catarrhal jaundice and mumps.

SUMMARY

(1) Four cases of epidemic jaundice in a child and three nurses who worked in the same ward are described.

(2) The incubation period in two cases appeared to be about five weeks.

(3) The common features of the disease may be obscured until jaundice becomes apparent.

(4) The importance of the leucocyte count in early diagnosis is emphasised.

(5) Oöphoritis was a complication in one case.

We are indebted to Miss Bolton, Miss M. E. Landau, Dr. Olivier Richards, and Miss W. Hall, of the honorary medical staff of the Elizabeth Garrett Anderson Hospital, for permission to publish their cases; to Dr. Elliott and Dr. Alston for animal investigations; and to Dr. William Gunn, of the North Western Fever Hospital, for notes of the case which came under his care.

BIBLIOGRAPHY

Barber, H. (1937) *Brit. med. J.* **1**, 67.
Bashford, H. H. (1934) *Lancet*, **2**, 1008.
Blumer, G. (1923) *J. Amer. med. Ass.* **81**, 353.
Booth, W. C., and Okell, C. C. (1927–28) *Publ. Hlth, Lond.* **41**, 237.
Brugsch, T. (1933) *Münch. med. Wschr.* **80**, I, 717.
Cockayne, E. A. (1912–13) *Quart. J. Med.* **6**, 1.
Dawson, B. (1918) *Lancet*, **2**, 575.
Eppinger, H. (1922) *Wien. med. Wschr.* **72**, 290.
Findlay, G. M., and Dunlop, J. L. (1932) *Brit. med. J.* **1**, 652.
—— —— and Brown, H. C. (1931) *Trans. R. Soc. trop. Med. Hyg.* **25**, 7.
Frazer, E. M. R. (1935) *Brit. med. J.* **1**, 701.
Glover, J. A., and Wilson, J. (1931) *Lancet*, **1**, 722.
Gray, G. C. (1918) *Ibid*, **1**, 503.
Hartill, S. (1918) *Ibid*, *p.* 586.
Hindle, E., and Brown, H. C. (1925) *Ibid*, **2**, 372.
Jones, C. M., and Minot, G. R. (1923) *Boston med. surg. J.* **189**, 531.
Lakin, C. E. (1938) *Brit. med. J.* August 27, p. 437.
Lelis, P., and van den Branden, F. (1936) *Bull. Off. int. Hyg. publ.* **28**, 514.
Lindstedt, F. (1923) *Acta med. scand.* **59**, 209.
Lisney, A. A. (1937) *Brit. med. J.* **1**, 703.
Montford, T. M. (1934) *Ibid*, **1**, 330.
Morgan, M. T., and Brown, H. C. (1927) *Rep. publ. Hlth med. Subj., Lond.* No. 42, p. 1.
Pickles, W. N. (1930) *Brit. med. J.* **1**, 944.
—— (1936) *Brit. J. Child. Dis.* **33**, 192.
Ramage, G. (1935) *Publ. Hlth, Lond.* **48**, 391.
Richards, R. M. (1933) *Proc. Derby med. Soc.* **32**.
Sergeant, B. (1937) *Brit. med. J.* **2**, 703.
Thewlis, E., and Middleton, W. S. (1925) *Amer. J. med. Sci.* **169**, 59.
Wallgren, A. (1930) *Acta pediatr., Stockh.* suppl. 2, **9**, 1.
—— (1936) *Med. Welt*, **33**, 192.
Williams, H. (1923) *J. Amer. med. Ass.* **80**, 532.

NATIONAL COUNCIL FOR MENTAL HYGIENE

THIS council's fifth biennial conference on mental health was opened at the Central Hall, Westminster, on Jan. 12 by the DUKE OF KENT.

At the first session the subject of discussion was Is Our National Intelligence Declining? Dr. L. S. PENROSE forecast an inevitable decline in average intelligence as a result of decreased fertility; though the process would, he thought, be a slow one. Dr. ALEC RODGER, however, pointed out that many factors distinguishable from intelligence played an important part in success and in the solution of major problems. The decline in intelligence was nevertheless of some importance. Much could be done about it by improving the lot of the less intelligent members of the community. Prof. J. H. NICHOLSON pointed out that for practical purposes the only intelligence which counted was that which was actively at work in the real world. Scientific reason was a specialised instrument of thought inadequate to the wider purposes of living; if "reason" were to be man's sole guide it must include those elements which it had held for Plato, particularly its concern with values. It was essential to handle experience in two ways—by scientific reason and by emotion. The problem of emotion, and the values bound up with it, must be tackled.

SHOULD MENTAL TREATMENT BE PRACTISED SOLELY BY DOCTORS?

Presiding at a debate on psychotherapy by laymen, Prof. JOHN MACMURRAY observed that if mental treatment were to be practised solely by doctors a number of people like himself were going to have a very bad time. As a teacher, he had always thought that mental treatment was part of his job, and his clerical colleagues felt the same. Science was organised common sense, and the line between a scientific technique and the ordinary dodges, used every day by teachers and ministers, was a rather thin one. Obviously safeguards were essential for persons who submitted themselves to psychotherapeutic operation. Everyone would agree on the need for guarantees, similar to those demanded from doctors of medicine, from those who claimed professional status as doctors for mental illness. He hoped to find out from the discussion whether or not such guarantees could best be provided by limiting psychotherapy to qualified doctors; whether medical practitioners made or were likely to make the best psychotherapists; whether a medical degree was a guarantee of sound psychological practice; whether a psychotherapist was more reliable because he was a doctor; and indeed whether doctors should be allowed to practise at all nowadays if they were not qualified psychotherapists.

The Rev. F. E. ENGLAND, Ph.D., said that every observant clergyman and physician was aware of the existence of deep psychological problems underlying many of the spiritual difficulties and physical symptoms in his parishioners or patients respectively. The confessional, or interview in the minister's study, often revealed a condition of spiritual distress which was the direct result of some emotional maladjustment. There were two reasons why it was undesirable to leave psychological treatment entirely to medical psychologists. The first was the purely practical fact that they were not available to the vast proportion of the psychologically ill. The second reason was that the medical psychologist, as such, was inadequately equipped to deal with certain types of mental illness. The therapist could not fail to influence the patient's philosophy of life, and if he worked with an inadequate philosophy of his own he must fail to handle aright the ethical and religious implications of the patient's experience. The moment anyone asked the question what positive characteristics the healthy man should be presumed to possess he went far beyond mere psychology. No person was in full personal health unless he was in some real sense adapted to his spiritual environment. Man failed to reach his full stature until he became aware of a spiritual order which not only laid a powerful constraint on him but excited in him a feeling of adoration. The therapist who groped in this realm with imperfect vision and understanding would wound rather than heal. It was true that as yet few of the clergy were fully equipped to take their share in the healing of the mind, and a serious attempt should be made to provide postgraduate facilities for the study of psychotherapy by those who had aptitude. The general assembly of the Church of Scotland had appointed a committee to consider providing such facilities, and the problem was being approached in

England by the Guild of Pastoral Psychology and the Archbishop of York's committee. Between the crude materialism of the purely scientific method and the crude supernaturalism of the mere faith-healer there was room for a technique based on a philosophy that took into account the non-material realities to which the human personality was related. There was no suggestion that trained clergymen should undertake the general practice of psychotherapy.

Dr. R. G. GORDON said it was obvious that non-medical psychotherapy had been practised in the past, was being practised in the present, and would be practised in the future. The doctor's primary concern with diagnosis was the basis of all his criticism of unqualified practice. The unqualified practitioner, if left uncontrolled and unsupervised, might do a great deal of good but sooner or later would make a bad mistake. The solution that would some time or other evolve was that the patient would go to a doctor for diagnosis and be referred on by him to a lay (or medical) psychotherapist. Meanwhile there was the difficulty of the General Medical Council's attitude towards "covering." Another difficulty was the delicate intimacy and subjectivity of the material of psychotherapeutic consultations, which made interim discussions between therapist and doctor very hard to arrange. The training of the psychotherapist must include a high cultural background, but there was no agreed scheme of training or list of qualities necessary for the work. A long and expensive personal analysis was often prescribed but no twelve psychiatrists would agree on the meaning of the term analysis. These difficulties made it necessary to move slowly and cautiously, but were not insuperable.

Mrs. HONOR CHAMPERNOWNE declared that the fundamentally important fact was the psychotherapist's own training (including analysis) and experience. Few might be able to afford long and expensive training, but if anything it was easier for the non-medical than for the medical man. Medical psychotherapists were totally unable to cope with the long waiting-lists of those who needed treatment. The medical psychotherapist with inadequate training, and his personal conflicts unresolved, was quite as dangerous (if not more dangerous) to the public than the properly trained layman. Some schools of psychology gave full importance to the spiritual aspect of the problem. Whatever the origin of the psychotherapist, his training must be adequate.

The Rev. H. LINTON (Guild of Pastoral Psychology) quoted: "If you parsons only did your job rightly, we psychotherapists would have much less to do." Illness of the soul did not always reach such a degree as to need treatment by a fully trained medical psychologist. In his thirty years' ministry he had been saddened by his inability to help certain people, and he had come to the conclusion that he must secure training in psychology in order to do his job properly. When he had sought this training he had been told that the work must be left to doctors. Clergymen needed thorough training in psychology in order that they might deal with people who would never go to a medical psychologist. He appealed for the thousands who needed this kind of help.

Miss GRAHAM IKIN spoke of her work on coöperation between doctors and clergy. Efforts were being made to get a common point of view that had really been digested by both professions. A memorandum setting forth a scheme of training had been achieved. The chief criticism of the standard suggested for clerical specialists was that it was much higher than that exacted from the medical psychotherapist! There was probably a very real delimitation between the spheres of the clerical and medical psychotherapist, and its recognition might greatly conduce to national mental health. At present the two were overlapping very much, and many doctors felt they were struggling with problems with which they could not cope.

Dr. ETHEL DUKES said that play therapists were a very useful adjunct to any child-guidance clinic and made it possible to deal with a much larger number of children. They were required to have had teaching experience, to take a psychological diploma and a personal analysis, and to do three years' training. They did most valuable work, in conjunction with doctors who saw to the physical aspects of the case.

Mrs. SCOTT MAXWELL emphasised the long and careful training she and other lay analysts had had, and said that almost all her cases came to her through doctors, and hardly ever had any physical symptoms.

Dr. DORIS ODLUM stressed the importance of diagnosis and the risk that arose if the lay worker were not in close contact with a doctor. It was fatally easy to assume neurosis and overlook organic conditions. She believed that lay psychotherapy was invaluable and inevitable, but there would be grave danger to the public if the medical profession did not stand behind it. The medical psychotherapist without mental hospital experience was not competent to diagnose incipient psychosis.

Dr. E. F. SKINNER mentioned the need for more fundamental agreement, and for a combined curriculum, so that doctors and ministers spoke the same language. There were many churches, but only one medicine.

Dr. F. J. ESHER spoke of the importance of teaching simple mental hygiene to the general public, including teachers and doctors. A number of simple and understandable conditions in a child's home led to trouble.

The CHAIRMAN said the discussion had shown that there was a very wide field where the importance of lay psychotherapy was unquestioned, and the problem of guarantees only arose in a very small area of the total field. Dr. Gordon's arguments were sound in so far as they dealt with the cure of disease, but the wider realm of educational psychotherapy did not touch mental disease.

Dr. GORDON, in reply, said that if there were in fact "only one medicine" that medicine was entirely ignorant of psychology.

Outpatient Mental-treatment Clinics

On Friday morning the conference discussed the psychological factor in sexual delinquency. In the afternoon the subject was the organisation and staffing of outpatient clinics.

Sir LAURENCE BROCK took the chair, and Dr. W. J. T. KIMBER described the clinic associated with the Hill End Mental Hospital. He pointed out that it was essential to treat the whole individual and that therefore mental healing must be carried out in a place where facilities were available for the coincident treatment of bodily ailments. At Hill End there was no absolute separation between the hospital with its inpatient staff, and the clinic with its outpatient staff which also engaged in private practice. The psychiatric social workers worked without discrimination for both. Provision for vocational guidance had been found essential, and there was a child-guidance department. It was an advantage to have children in the same clinic as adults, because treatment of parents

was often necessary and also because the air of informality given by a children's department greatly helped shy and sensitive adults. The most important point in clinic procedure was the initial case conference at which the whole of the facts were assembled and the regime laid down by a team of workers. From the beginning, Hill End had attempted to avoid the pitfall of "treating a patient as though he were a bank," as Lord Horder had put it. One of the senior members of staff was personally responsible for each patient throughout his treatment. It was essential that the environment of the clinic should not be makeshift, dull and dreary, or cold and forbidding. A patient should feel on his arrival that he had been expected. All patients were seen by appointment. There was a close liaison with the neighbouring general hospital, where patients were seen weekly without an appointment and a diagnostic service was given.

Dr. ODLUM said that outpatient mental clinics had now been working for about ten years and that it was possible to draw conclusions as to the best methods of organising them. She agreed with Dr. Kimber that ideally they should be linked up with both the mental and the general hospital, and that the medical staff should be drawn both from the mental hospital staff and from doctors of both sexes in private practice. It was essential to hold a session at least once a week, and the best arrangement was two or three times a week. Continuity of personnel was important. The staff must have special training in psychotherapeutic methods. The most suitable locale for the clinic seemed to be the general hospital, where patients could easily be referred to other departments for investigation, and where there was no popular reluctance to be associated with "mental" cases. A whole-time specially trained social worker was absolutely necessary. Such a clinic was needed in every area of the country; and ideally a doctor should not see more than 5 old patients and 3 new ones in a session of three hours. Obviously the local authority should take some financial part in the clinic.

Miss ELIZABETH MARTLAND, J.P., sympathised with the average councillor who had to apply his harassed and lamentably overworked mind and the dwindling and lamentably insufficient rate-payers' money to the formidable claims of many public health services. She was puzzled as to the best name for these clinics; in her own town the mental clinic was referred to as the "neuro." She would like to see many more established, for they were doing valuable work. She thought that many patients were afraid to go anywhere near a mental hospital and some shrank from the general hospital for fear of gruesome physical contacts. She thought that the solution was provided by a scheme of special hospitals for psychoneurotic and borderline cases with outpatient clinics attached. It was useless if the clinic were open only one afternoon a week; evening sessions were also absolutely essential. She pleaded for closer coöperation with the various and elaborate social, medical, and dental services throughout the country, and for greater uniformity of service. She wished that more local authorities could institute early-treatment centres and a coördinating mental-health committee. In the more backward and distressed areas the situation was deplorable, not only cruel and inefficient but extremely wasteful. Doctors and social workers must have some special training for the work.

Dr. HELEN BOYLE thought a harmless name for the clinic was most important; "nervous" was the best word at the present time. An outpatient clinic was incomplete and inefficient without beds, entirely separated from mental hospital beds. The local authority should be allowed to pay for their patients wherever they chose to send them. Any new buildings should be of the temporary-hut type; so little was known of what would be wanted in the future. The general hospital was the best locale for the clinic.

Dr. G. DE M. RUDOLF pleaded the cause of those who were really terrified of anything "mental." The attitude was by no means rare. For them there should be a clinic quite separate, in staff and locality, from the mental hospital. By all means let it work in coöperation with the mental hospital clinics.

Dr. F. BACK said that the clinic in Sunderland had been running for 13 years and had always had three weekly sessions. Recently three child-guidance sessions had been added, held at the medical clinic of the education committee. He thought "psychological clinic" was the best name. He approved of appointments but also believed that the clinic should be always available without appointment.

Dr. SKINNER said that in Sheffield the clinic was officially known as the "psychological," unofficially as the "cuckoo" clinic; he thought "nervous clinic" was better. He used his general beds for nerve cases. An outpatient clinic ought to be attached to every general hospital and should have beds of its own. It was impossible to deal adequately with the material presenting itself at these clinics, and the only solution was to have a paid staff; the local authority must step in here. His medical clerks attended the taking of histories in the psychological clinic, but not the treatment sessions; patients occasionally objected to their presence.

Mr. P. T. P. PUDDICOMBE pleaded for the more grammatical "nerve hospital." The work must eventually be part of the responsibility of the local health authority, and the staff should include mental hospital officers and suitable practitioners. The nerve clinic should be part of the combined treatment centre, to which no stigma attached.

Mrs. PHEYSEY (chairman, Bristol Mental Hospital) spoke for the woman in the street, and voted for "nerve clinic"; people thoroughly enjoyed having bad nerves. Local authorities had to borrow money for their building and could not borrow for shacks. Shack building was unhealthy building.

Mr. ROLAND SMITH (chairman, Hill End) thought "nerve clinic" was the right term. With the taboo that existed on such things, finance committees were sometimes a little hesitant to foot the bill for mental health; the clinics were prophylactic and could never produce a rise in statistics or a return for money spent; he wished the board would publish figures of what other local authorities were doing.—The CHAIRMAN promised that it would.

Dr. OCTAVIA LEWIN said that the mind could not be separated from the body. "Nervous clinic" was a good sensible name. It was impossible to have an outpatient clinic without beds. The work of the clinics would be lessened if the educational side of psychology were properly tackled.

Dr. A. SPENCER PATERSON said that over fifty years ago professors of Greek and English had consulted over the new clinic in Edinburgh and decided to call it the "nerve hospital." In Baltimore the term "psychiatric" was used, but the clinic was popularly known as "the bughouse." At the Middlesex Hospital the department was called "psychological medicine." The choice should lie between "psychological" and "nerve."

Miss BARTON pointed out that the Institute of Child Psychology and the Institute of Medical

Psychology had both found it impossible to obtain charitable support while they had the word "psychology" in their title.

Mental Hygiene and the Press

On Friday evening the chair was taken by Mr. W. F. ROCH.

Dr. J. R. REES, opening a discussion on the influence of the press on the health of the community, said that a real advance had been made lately by the prohibitions imposed on reporting in the divorce-courts and the children's courts. Many would wish that suicides could be treated with the same discretion. Stories of suicide undoubtedly affected many other persons who were depressed. There was not sufficient selectivity by the press in dealing with their stories. The emphasis they gave was often wrong. Many papers would lose their circulation if the housing, economic, and social conditions of the country were better than they were at present, so that men and women had more scope for themselves and more chance of adventure. The avoidance of truth and of reality were clearly unsound for mental development, and astrology was a phase of newspaper history of which the country had every reason to be particularly ashamed. Both the patent-medicine columns and the astrologer's notes aimed at the prostitution of such little intelligence as some of the readers possessed. Wickham Steed, in a recent Penguin book, "The Press," referred to the trusteeship of the press for the health of the public mind. Dr. Rees believed that the responsibility of the press was perhaps greater even than that of the doctor, and professional standards should be established stricter than anything yet known. The function of lay men and women was to support good and honest journalism whenever they could: to be critical of their favourite journals and especially of their advertising. Demands and criticism must produce effect on newspapers. Children might with profit be set to the lesson, or game, of studying different types of newspapers and making graphs of the space allotted to various topics, such as home and foreign affairs, literature, murders, and sport. Many of them would probably become critical of the matter which the press offered the public and would be more discriminating readers in the future. Young men and women of culture and education who were really well balanced should be encouraged to go into journalism and into newspaper management.

Mr. PAUL WINTERTON, of the staff of the *News Chronicle*, criticised the medical profession for trying to conduct not only its private meetings but its whole business in camera, for shrouding its work in a jealous secrecy, and for using an unintelligible jargon. A great responsibility rested upon medical men to use their wide knowledge in willing coöperation with the press, and to instruct the public on matters of health in general and mental health in particular. Medical etiquette appeared to prevent them from doing this. To spread truth and knowledge through the press in a signed article was, if not actually infamous conduct, at any rate conduct to be frowned upon. A specialist when rung up on the telephone for guidance was generally either shy or indignant. Mr. Winterton congratulated the National Council for Mental Hygiene on their press service, but added that every mental health organisation in the country ought to establish a bureau for supplying the press with articles and topical comment. A first-class press department at the Board of Control would be of great service, and could in a few years entirely transform the public attitude to mental health.

Dr. N. G. HORNER, editor of the *British Medical Journal*, paid tribute to the National Council for its pioneer work in fostering the ideal of mental health. The medical press, he said, had no cause to be ashamed of the part it had played in promoting mental hygiene. The better class of doctors would coöperate more willingly if they were asked to interpret matters of importance rather than trivialities. The rule enjoining anonymity was not so foolish or perverse as Mr. Winterton appeared to think. It was aimed against self-advertisement, especially by doctors in active practice. There were self-styled specialists, mostly hungry, pushing men, who would give much to have their names and photographs in all the newspapers as purveyors of information and opinions. The rule of anonymity kept those bounders within bounds, and meant that Dr. Donald Duck did less public quacking. The real experts would be more helpful and obliging if newspaper men were a little more discriminating. It must be rather vexing to a doctor to be interrupted in a difficult case, or pulled back from his bedroom at the end of a hard day, when he found that the telephone call asked him to comment on a report received from a Paris agency that malaria could now be cured by a new drug called G.P.I.

The body known as P E P, Political and Economic Planning, in a descriptive and critical survey of the press, had declared that its chief faults were triviality, exploitation of crime and sex, sensationalism, over-simplification, over-emphasis on the personal story to gratify a mere taste for gossip, and playing down to subconscious instincts. It summed up the attitude of the popular press in an epigram: "Bad news is often good news, in the sense that it makes good copy." The criticism had, however, extended to the tastes of newspaper readers, large numbers of whom would, it was said, support a newspaper which was considerably more sensational, scandalous, and irresponsible than anything which the scruples of journalists, advertisers, and proprietors, and the restraints of law, would now allow to appear. The British public rewarded with high profits the owners of a newspaper which kept as closely as possible to the unprintable. If that was the mind of the British public, asked Dr. Horner, could the press be blamed? The medical journals contained a good deal of matter which could be profitably passed on to the public, and the profession as a whole would like to coöperate. Was it asking too much of the press to take a little more serious interest in articles in the *Lancet* and *British Medical Journal* than in the man with three thumbs or the baby which weighed as much as its mother?

Dr. MURDO MACKENZIE pointed out an important difference between the facts of the mind and those of the body: they were not accessible to the special senses. He had perceived behind Dr. Rees's speech the suggestion that if the press took a constructive point of view in mental hygiene they would have to take the lead in giving an accurate description to the things which were unseen as well as the things which were seen. Perhaps there had been a doubt in Mr. Winterton's mind whether unseen things could ever receive the same form of public presentation. It was necessary to inquire whether any other means existed by which the press could give force to a constructive point of view in mental hygiene. The facts of science had always been difficult to the press, but they had come into public presentation in due course because their inevitability had been recognised by common consent. This inevitability had resulted first of all from the conversion of a minority, and that minority must be well informed. To be well informed about

the facts of mental hygiene was no easy matter but needed pure unadulterated slogging. The informed minority must then, from a concise clarity of mind, state the facts to the press in a convincing manner. If the minority worked hard enough the public mind would inevitably demand this knowledge and the press must succumb to the demand.

Mr. S. H. HALFORD (Middlesex county council) quoted the opinion of a responsible newspaper manager that a paper which was conducted by ordinary sensible and decent standards would sell about 35,000 copies a day. Before the Education Act, 1870, people had learnt to read because they wanted to improve their minds; since reading had become compulsory the intellectual standards of the reading public had become debased and a vast market had been introduced for unintelligent literature. Control of the press would, however, be too dearly bought at the price of liberty.

Dr. REES, in reply, said he proposed that control of the press should be exercised by journalists themselves and not by the executive.—Mr. WINTERTON declared that the medical profession was not yet pulling its weight in the councils of the nation, however valuable might be its work. He reminded doctors that it had been left to a layman to tell the public the marvellous and extremely important story of the malarial treatment of general paralysis.

The conference also discussed education and the emotional needs of the child, problems of adolescent instability and juvenile delinquency, and the place of the social worker in mental health.

MEDICINE AND THE LAW

Bogus Doctor

LAST week at the Middlesex sessions two men who had posed as solicitors were sentenced to 12 and 9 months' imprisonment respectively. On the same day at the Old Bailey a dentist who had posed as a doctor received 6 months in the second division. One must resist the temptation to assume that a bogus solicitor is more hateful to the law than a bogus doctor.

The dentist was Henry Bernard Langdon, aged 53, with an address at Walthamstow. According to the police he was married in 1907 and for a time kept a second-hand clothes shop; he and his wife afterwards "entered dentistry" at Walthamstow; in 1923 he bought his wife out of the business which had earned £2000 a year; he first came to the notice of the police in 1936 when he "attempted to engineer a marriage between an Italian woman and a man who was found to be a deserter from the army." A detective-sergeant told the court last week that for the past year or two Langdon had been posing as a doctor in the West End of London, chiefly among members of the theatrical profession. The prosecution stated that Langdon was introduced to a Mr. and Mrs. X as "Dr." Langdon and made no comment. Mrs. X was not in good health. Langdon said he would examine her. He told her to undress and, in her husband's presence, he made his examination. He was paid for the treatment he prescribed. The charge against him was one of obtaining money by false pretences; there was also a charge of improperly assaulting Mrs. X. In the absence of a full report of the case it is assumed that the latter charge related to the technical assault of medically examining a patient who had given her consent in consequence of a fraud—namely, the false pretence made by Langdon that he was a qualified medical practitioner.

Whatever were the facts in Langdon's case, the general legal position is that consent is usually a defence to a charge of assault but that fraud vitiates the consent. There are well-known cases which illustrate this principle. R. *v.* Rosinski (1824) showed that a medical man (or a person pretending to be a medical man) commits an assault if he strips a woman naked on the pretence that he is diagnosing her illness. In R. *v.* Case (1850) the patient's consent was vitiated by the fraud when a man induced a girl to have connexion with him on the pretence that he was treating her medically.

"Without the Patient's Consent"

It is perhaps unnecessary to repeat the warnings in the textbooks as to the illegality of medical examination under the supposed authority of a magistrate without the patient's consent. Judges, magistrates, and police have no power to order compulsory examination. In Weir *v.* Hodgson (*Lancet*, 1869, **1**, 752) £200 damages were awarded against a surgeon and a police inspector who insisted on examining two women in order to find out whether either of them had been recently delivered of a child. Two years later there was a distressing case (*Lancet*, 1871, **2**, 333, 414, 477) where a woman was suspected of infanticide. Two doctors attempted to examine her under the authority of a coroner's order; she committed suicide rather than submit to the examination. The coroner had no power to make any such order. In Agnew *v.* Jobson (1877) a prisoner who was charged with concealment of birth was examined without her consent by a doctor on a magistrate's order. She recovered damages against the doctor, the police, and the magistrate.

By way of exception there used to be one single occasion on which a woman could apparently be examined against her will—namely, when she had been sentenced to death and had asserted herself to be pregnant. The next step was the empanelling of a jury of matrons *de ventre inspiciendo*, to decide whether her assertion was true or not. In 1931 this ancient relic of the criminal law was abolished by the Sentence of Death (Expectant Mothers) Act. Thereafter, if the same situation arose, the question of pregnancy was left to be decided by an ordinary jury like any other question of fact. The jurors were to give their verdict "on such evidence as may be laid before them either on the part of the woman or on the part of the Crown," and they were to find her not pregnant unless the contrary were affirmatively proved.

Consent to Dental Extraction

When there is no element of fraud, there may be a dispute over the fact of consent. Recently in the Macclesfield county court a patient complained that she had consented to the removal of only four teeth whereas the dentist had extracted sixteen. There was a sharp conflict of evidence, the dentist insisting that he had advised the extraction of all the teeth in view of their decayed state and the presence of chronic pyorrhœa, that the patient had fully understood and consented, and that the services of an anæsthetist would not have been necessary for the extraction of only four. The patient, her husband, and her mother had given evidence to the contrary. The county court judge came to the conclusion that the parties had arranged for only four teeth to be taken out. He thought the explanation of what

occurred was that, when the dentist had taken out the four teeth, he found they were in a bad way and then, acting on the spur of the moment, had decided to make a clean sweep. As a matter of law the dentist was not entitled to do this. His instructions were to extract four and there were no circumstances which justified him in exceeding that authority. The judge awarded the patient £12 12*s*. damages for the shock she had suffered and gave her judgment with costs.

It probably does not occur to a dentist to obtain a consent in writing for the extractions he is about to make. In more serious surgical operations there is no safety in oral instructions.

Fee for Emergency Treatment

By section 16 of the Road Traffic Act of 1934 Parliament gave medical practitioners some kind of security that they would be paid for services rendered in emergency to the victims of traffic accidents. The amount of the fee was made part of the liability against which the motorist is compelled to insure. But the wording of the section specifies that the doctor must have rendered his aid "immediately" after the accident. A recent case in the West London county court shows that an interval of half an hour after the injury may prevent the doctor from claiming a fee from the motorist. In the West London case a woman was loading goods into a van near the Strand when a taxicabman, backing his cab, pinned her against the van. Refusing to go to hospital, she was driven to her home in Fulham where she arrived about 35 minutes after the accident. Dr. Evelyn Nixon of Lillie Road, Fulham, and Harley Street, happened to be passing and was able to render first aid; she gave an injection, the patient being in a state of collapse. When Dr. Nixon applied for payment of the fee of 12*s*. 6*d*. by the cabman, the latter contended that the medical aid was not given "immediately." This view was upheld by the registrar who decided against Dr. Nixon with costs. The doctor is free to sue the patient in the ordinary way, and presumably the patient can recover the amount from the negligent motorist. The case shows the limitations of the statutory claim under section 16.

FIRST-AID POSTS AND HOSPITALS IN AIR ATTACK

THE Ministry of Health has now decided that in drawing up their schemes for air-raid precautions local authorities should provide for the attendance of at least one doctor in each first-aid post, and if possible a trained nurse as well. The doctor's function will be to intercept the walking wounded and those unwounded but gas-contaminated cases who are otherwise likely to gravitate to the nearest hospitals and hamper their proper work of dealing with the severely injured. The Ministry suggests that a first-aid post should be attached or very close to every hospital that is to be used for the initial reception of casualties, and that the outpatient department itself could often be used for the purpose. It might then be convenient for the medical and nursing personnel of the post to be drawn from the hospital staff. Some of the smaller hospitals and clinics, which would be unsuitable for the reception of casualties, could also be transformed into first-aid posts. In some places buildings other than medical will have to be selected as posts and in the less populous areas the fixed posts might usefully be supplemented by mobile units, consisting of converted motor vans or single-decker buses.

In a booklet [1] issued by the Ministry of Health this week hospital authorities are urged to proceed at once with measures to protect their buildings against air attack, especially if they are situated in densely populated areas or near likely targets, and it is stated that the Government are prepared to contribute towards the cost. According to this booklet it is not practicable to protect hospital buildings from direct hits by high-explosive bombs or from the blast effect of such bombs falling within 50 feet, but some protection against blast and splinters can be given on the ground floor by sandbagging walls, windows, and doors. In many hospitals the operating-theatres are especially vulnerable owing to their wide expanse of glass, and where adequate protection by sandbags or brickwork is impossible arrangements should be made for alternative operating-rooms in less exposed parts of the building. For dealing with gas cases provision must be made for outside shelters where contaminated clothing can be removed before admission and for baths for cleansing contaminated areas of skin.

In constructing new hospitals the booklet urges that the risk of air attack should be considered in the selection of sites. There is little to choose between a multi-storied compact building that will offer a small target and a single-storied building which would be less susceptible to direct hits or fire. Buildings should be steel-framed with reinforced concrete roofs at least five inches thick, and enclosed courts, high chimneys, and roof lights should be avoided as far as possible. Where there is to be a basement it should be made suitable for an air-raid shelter, with a roof strong enough to withstand the fall of debris if the superstructure collapses.

[1] Structural and other Precautions against Air Raid Risks in Hospitals. H.M. Stationery Office. Pp. 12. 3*d*.

THE LANCET 100 YEARS AGO

January 19, 1839, *p.* 617.

From a leading article.

"It is a pleasant thing to see brethren dwelling together in unity: it is like the oil upon AARON'S beard." Without pledging ourselves to the literal accuracy of the quotation, or to the justness of this simile, we undertake to say that it is very pleasant to see the medical men of a neighbourhood living together amicably, cultivating science peacefully, and labouring zealously for the public good. If we have sometimes found ourselves in the midst of war, and sometimes led the van, it is not because we have ever been insensible to the charms of the smooth, easy, oily state of things, so congenial to a learned profession, but because general practitioners and the great body of our brethren have had presented to them, ever since this Journal existed, the alternative either of agitation, or of tranquillity with dishonour, degradation, and exclusion from all offices of distinction and profit in the medical corporations. Under such circumstances war was indispensable. . . .

THE LANCET Index and Title-page to Vol. II, 1938, which was completed with the issue of Dec. 31, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post card addressed to the Manager of THE LANCET, 7, Adam Street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

SCOTLAND

(FROM OUR OWN CORRESPONDENTS)

ABERDEEN UNIVERSITY

THE opening of term at Aberdeen University brought the inaugural addresses of two new professors, Dr. R. D. Lockhart, professor of anatomy, and Dr. R. S. Aitken, professor of medicine. Speaking of the action of muscles, Prof. Lockhart described an investigation in which he and a colleague proved that many fibres run the whole length of a muscle, often as much as 30 cm. He also dealt with the difference between normal and controlled movement, illustrating his arguments with a living model and with numerous films. He showed radiograms of the feet of Pavlova and other ballerinas, and footprints of the shoeless Australian aborigines, whose feet, far from being splayed and ungainly, were as comely as those of shod peoples.

Outlining what he believed to be the function of a department of medicine in a university, Prof. Aitken said it presented itself under the headings of practice, teaching, and research. He spoke of the still largely empirical nature of practice and of the need for early practical experience. Tolerance, sympathy, and determination were qualities needed to make the doctor-patient relationship a fruitful one. The present system of training doctors was to load them up with knowledge; there should be a drastic selection of what was offered to the student, determined by the needs of medicine and surgery. Teachers might easily be misled into thinking that their best student was the one who could avidly soak up facts and later squeeze himself on to an examination paper, and they might even adapt their teaching to his sponge-like propensities. Every student of a university should learn to use a library and to read its books and journals critically. Bedside thinking should also be critical, and it was important that where laboratory methods could fully establish a diagnosis they should be undertaken by the student so that he would learn the association of clinical and laboratory findings from experience and not blindly from his teacher. In the wards there should be an atmosphere of friendly coöperation between doctors, nurses, and students. A department of a university which attempts no research in its own field, Prof. Aitken said, did not deserve its status and should belong to a technical school. Research was a mental discipline which helped clear and critical thinking, and this alone justified the policy of encouraging young graduates to spend a year or two in the laboratory. Contact between teacher and research worker should be close, for there was much to be gained on both sides.

EDINBURGH ROYAL INFIRMARY

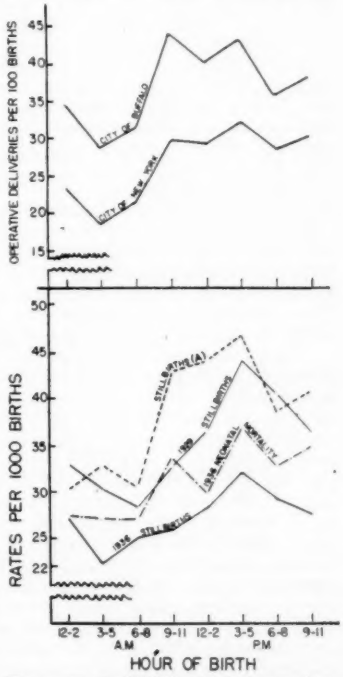
The annual report of the managers shows that the work of the Royal Infirmary has increased steadily during the past year, inpatients numbering 22,000 and new outpatients nearly 76,000. The popularity of the hospital is proving an embarrassment, but the managers hope that a scheme of coöperation with the municipal hospitals will relieve the situation. The hospital still has no paying beds except in one small department, and the financial position is causing the managers some anxiety. Last year the ordinary income was nearly £141,000, but this left a financial deficit of £71,000, part of which was paid by free legacies and special receipts amounting to £56,000. It is the first time for many years that the accounts have shown a deficit after making use of free legacies, and the managers point out that the extra commitments incurred in taking over the management of the new maternity hospital which is to be opened in March are likely to increase the burden on the institution. The new nurses' home, which provides accommodation for 300 nurses, will soon be finished. The total cost of the extension scheme exceeds £500,000, of which £400,000 has been raised. The chairman suggested at a meeting last week that the new maternity hospital might well be given a grant from state funds.

UNITED STATES OF AMERICA

(FROM OUR OWN CORRESPONDENTS)

THE HOURLY DISTRIBUTION OF STILLBIRTHS AND NEONATAL DEATHS

SEVEN years ago it was noticed by de Porte[1] that the stillbirth-rate reaches a peak between three and six in the afternoon. American obstetricians have offered various explanations of this phenomenon, of which the two most notable are, first, that since most labours begin at night most prolonged labours will end in the afternoon, and, secondly, that since doctors are busy in the afternoon they may be more readily disposed to operative interference then. Jacob Yerushalmy, until recently statistician in the division of maternity of the New York state health department, has now confirmed de Porte's original observation and has added some observations on the distribution in time of operative deliveries. The latter shows two peaks, one around 11 A.M. when hospital operating-rooms are normally busy and one corresponding to the peak of stillbirths in the afternoon. The relationship of the trends is shown in the accompanying figure. The author is careful to state that correlation does not necessarily imply causation.



The curve of stillbirths (A) is drawn from figures quoted in "Principles of Medical Statistics" by A. Bradford Hill, p. 96.

TRAINING HEALTH ADMINISTRATORS

Yale University has instituted what is probably the first course in this country to prepare health administrators for the task of supervising the distri-

[1] de Porte, J. V., *Amer. J. Obstet. Gynec.* 1932, **23**, 31.

bution of medical care. The title of the course is "Public Health Problems Related to Tax-Supported Medical Care." There will be a symposium of lectures on "World Background" by a distinguished German exile, Dr. Franz Goldmann; "The American Scene," by the professor of public health, Dr. C.-E. A. Winslow, and Prof. Ira Hiscock; and "Practical Experience in the United States," by Dr. H. Jackson Davis, chief medical officer of the New York state department of social welfare. These will be followed by more specific discussions of social service problems and the relations of hospitals to the medical profession, voluntary agencies, and the health department.

FRESH WORK ON PELLAGRA AND NICOTINIC ACID

Working in the University of Cincinnati Tom D. Spies, R. W. Vilter, and S. P. Vilter have shown that the blood of normal persons on well-balanced diets supports the growth of *B. influenzæ* to a much greater extent than does the blood of pellagrins who are on deficient diets. After the administration of adequate amounts of nicotinic acid the growth-promoting activity of the blood of the pellagrins is increased. Cozymase (or co-ferment) is also increased in the blood of these patients after giving nicotinic acid, and the investigators think that the therapeutic effect of nicotinic acid in pellagra may depend on the synthesis of nicotinic acid nucleotide and finally codehydrogenase in the body. Since they have found that a number of other chemical substances are also beneficial to certain pellagrins in relapse, it may be that the same general biochemical system or systems are involved in these various deficiencies in water-soluble vitamins.

That these observations are of general importance is indicated by the fact that the blood from patients with severe diabetic acidosis also supports the growth of *B. influenzæ* much less than does the blood of normal individuals or the blood of the same diabetic when regulated or given large doses of nicotinic acid. The addition of codehydrogenase to the deficient blood, or to autoclaved media without blood, makes it support luxuriant growth of the influenza bacillus, although nicotinic acid amide shows no such growth stimulation.

PARIS

(FROM OUR OWN CORRESPONDENT)

EXPANSION OF THE PASTEUR INSTITUTE

IN 1884 Louis Pasteur started a laboratory in Garches, a suburb of Paris, and it was here that diphtheria antitoxin was prepared for the first time. The Garches institute was somewhat put into the shade by the new one which came to be known as the Pasteur Institute of Paris, and it might have been relegated to unenterprising obscurity but for Gaston Ramon who during the past fifteen years has made its name famous by his investigations of diphtheria and tetanus. As his work has grown the original buildings in Garches have become too small and new laboratories have had to be built for the production of anatoxins (toxoids), for the study of antigens and antibodies, and for testing recent discoveries. These new laboratories were formally opened on Dec. 22 last by the minister of public health who took the occasion to decorate Ramon with the collar of a commander of the Legion of Honour.

In a brief address Prof. Ramon traced the history of the Garches institute since 1884. From the study of rabies its staff had passed to that of diphtheria and then to that of tetanus, and the preparation of anti-diphtheria and anti-tetanus sera had assumed large proportions. He claimed on behalf of his anatoxin that it had reduced the diphtheria mortality by about three-quarters in ten years in Paris, where only 50 per cent. of the children were inoculated; it had reduced the mortality by more than nine-tenths in New York where 80 per cent. of the children were inoculated; and it had practically stamped out diphtheria in Canada where almost every child is inoculated. Turning to the anatoxin prophylaxis of tetanus, he said that the ten-year application of this system to army horses had rid the French cavalry of the disease. Compulsory inoculation against tetanus had been in force among the French troops since the law of Aug. 16, 1936, had become effective. The simultaneous immunisation of the army against diphtheria, tetanus, and typhoid fever had caused no inconveniences marring the successes achieved. Prof. Ramon added that the new processes devised at Garches had yielded, in a quarter of the time formerly required, antitoxic sera from five to ten times more active than before.

INSTITUTIONAL CARE OF THE INSANE FOREIGNER

Every time an insane foreigner shoots and kills a sane Frenchman there is an outcry in the press over the abuse of French hospitality. This easily comprehensible reaction has lately found expression in the request of a French senator to the minister of public health for information as to the nationality and the number of foreign patients resident in French mental hospitals. In his official reply, the minister puts the number at 4388. More than a quarter of them are Italians (1116). The Poles come a good second with 982, and the Russians third with 546. Spaniards, Belgians, Turks, Germans, and Czechoslovaks are each represented by three-figure numbers. The British come comparatively low in the list with 64, and Korea, Denmark, and Norway are at the bottom of the list with only one patient apiece.

A BADGE FOR THE MEDICAL MOTORIST

IN 1929 the Association des Médecins Automobilistes de France came into being in response to the instinct which makes birds of a feather flock together. A specific objective of this new body was the devising of a distinctive badge, the carrying of which would enlighten and impress the onlooker. For some years now this badge has had an effective, if not yet quite official, recognition by the police. Their attitude to it has been defined as one of *tolérance aimable* as regards circulation and parking, and the same spirit of friendly tolerance is often shown by other motorists to motoring doctors. The badge has often proved helpful to doctors driving in thoroughfares in which political differences of opinion have generated casualties. The same association helps its members over legal difficulties, insurances, taxation problems, and those purchases in connexion with which substantial reductions can be obtained by corporate bodies.

"... It is a striking thing that when attempts are made to extend health and education services they are held up 'because we cannot afford them,' but when plans are developed for the war of man against man, they are at once put into action and we are called upon to make great sacrifices to pay for them. If these armaments are really needed I am prepared to meet their cost, but I maintain that the same attitude should be assumed in the war against Nature, and that when it is known that increased activity is essential for education and for health the cost must be faced just as much as it is claimed it must be for planes and battleships."—T. B. LAYTON, *Guy's Hosp. Gaz.* Dec. 31, 1938, p. 532

THE AIR-RAID

A series of articles on medical organisation and surgical practice in air attack by
P. H. MITCHINER, C.B.E., T.D., F.R.C.S., *and* E. M. COWELL, D.S.O., T.D., F.R.C.S.

III—GENERAL PRINCIPLES OF WOUND SURGERY AND ANÆSTHETICS

THE general principles of war-wound surgery differ considerably from those of ordinary civil practice, although they are somewhat comparable to those necessitated by the severe injuries met with in motor-car and industrial accidents. This difference in principles is due mainly to infection of the wound caused both by the carrying in of shreds of clothing and surrounding dirt with the projectile and by the considerable disruption of tissue round the wound track. Micro-organisms are thus introduced into the damaged tissue, often isolated from the surrounding air, in conditions which favour their rapid growth. The principle therefore to be observed in all war-wound surgery is the prompt and thorough excision of the entire wound track, together with the damaged surrounding tissue, and the primary suture of the resultant wound, or delayed (secondary) suture if primary cannot be carried out without tension.

Delay in transport caused by enemy action is likely to result in the wounds of many patients being already extensively infected before they come under the care of the surgeon, and the extent of the wound and the involvement or close proximity of important anatomical structures often render impossible complete excision of the wound track. As a general rule excision, to be satisfactory, must be performed within twelve hours of the infliction of the wound, and earlier than this if possible. After this period the chances of obtaining primary union after excision are extremely small, but in the case of superficial wounds it may be justifiable to perform this operation up to twenty-four hours, roughly approximating the surface of the resultant wound, when this can be done without tension and no obvious infection is present, and draining the incision for twenty-four hours. In cases seen after twenty-four hours, and in any case seen at an earlier period in which total excision is impossible, *débridement* of the wound must be undertaken. This consists in free excision of crushed and damaged tissue and the provision of adequate drainage from the most dependent part of the wound.

Débridement should always be carried out in the case of all extensive lacerated wounds in which coaptation of the surfaces after excision must of necessity entail tension and therefore should not be attempted. Compound fractures should be examined, obviously loose and necrotic pieces of bone removed, and the limb put up on a skeleton splint with extension. The delays so often seen in previous wars will probably not occur in the evacuation of most of the casualties in air-raids in cities, but there are bound to be delays owing to the blockage of streets by fallen buildings and to the necessity of rescuing the wounded from beneath the debris.

TYPES OF WOUNDS

The following types of injury are to be expected from the action of high-explosive and incendiary bombs; further, gas may be used by enemy aircraft, and the surgeon at any clearing station may therefore have to contend with decontamination of injured persons before operating upon them, or in certain circumstances he must operate in a gas mask (this should be practised in peace-time, for it is both exhausting and difficult).

(1) As a result of the blast of high-explosive bombs many crush injuries and fractures, due mainly to falling masonry, are bound to be met with, and in many cases these will be immediately fatal or the victims will be past surgical aid by the time they have been rescued from under the fallen debris. In the remaining cases severe mangling of limbs and compound and simple fractures will be the chief injuries.

(2) Many wounds will be due to the explosion of bombs and the falling fragments of shrapnel and shell casing from anti-aircraft guns. These fall into three main types:—

(*a*) *Lacerated wounds* due either to bomb casing, in which event whole limbs are often avulsed and the patient eviscerated, so that they come very seldom under the care of the surgeon, or, more commonly, to fragments of shell cases and shrapnel, in which event they are usually of moderate severity.

(*b*) *Penetrating wounds* usually due to high-velocity bullets fired from low-flying aircraft, a type of wound not likely to be much met with in London, where air defence against this form of aircraft is well organised and efficient.

(*c*) *Contusions* due to small fragments of falling masonry and by patients injuring themselves in their haste to enter air-raid shelters.

(3) *Burns* due to incendiary bombs and the resulting fires, and to chemicals, such as mustard gas or cordite.

Certain types of wounds deserve special consideration. *Chest wounds* are usually caused by bomb fragments; hence extensive laceration of the chest wall combined with damage to the underlying viscera ensures a high mortality. When the case is not immediately fatal, the wound and pleural cavity should be rapidly cleansed and the complete thickness of the parietes promptly closed, so as to allow the lungs to expand. This operation, to be successful, will probably have to be performed at a dressing station. If, after suture, the patient has a little dyspnœa or cyanosis, he is best left quiet in any position comfortable to him, and no attempt should be made to interfere with the wound for at least twenty-four hours, after which it may be explored, if necessary, under intratracheal anæsthesia, and any fragments of shell may be removed after being localised by X rays. When there is hæmorrhage from the great vessels, heart, or lungs, prompt operation to secure hæmostasis is essential, and the same procedure must be carried out in ingravescent pneumothorax to crush and ligate any patent bronchi.

Abdominal wounds.—All wounds of the abdominal parietes must be explored and, if there is any doubt about penetration of the abdominal cavity, laparotomy performed. The common complications are internal hæmorrhage and perforation (often multiple) of the intestines. Internal hæmorrhage must be arrested by ligation of the blood-vessels and by suture, excision, or plugging of damaged solid viscera and a systematic search made of the entire intestinal tract from the stomach to the colon in cases of suspected perforation. Such search must be conducted foot by foot, the intestine being returned immediately after examination, while a lower portion is withdrawn through the laparotomy wound. Small perforations can be invaginated, but extensive ones need excision and suture of the gut.

Wounds of the head fall clinically into two types: (1) those with a thin rapid pulse and extensive damage to the brain (here an early fatal result is to be expected); and (2) those with a slow full pulse which have a fair chance of recovery if operation is performed. It is important whenever possible to radiograph these cases before operating, so as to locate the missile and remove it at the operation with as little disturbance as possible to the brain tissue. Should pre-operative radiography be impossible, the surgeon should content himself with excising the edges of the wound, removing the damaged or depressed fragments of bone and any obviously necrotic brain tissue, but forbearing to search for the missile unless it comes readily to hand in the wound.

Wounds of the spine should be treated by the operator much on the lines of those of the brain. Owing to damage of the spinal cord the subsequent mortality is considerable. In all cases with retention of urine a suprapubic cystotomy should be performed, for it has been proved that patients who have not been catheterised do not develop ascending kidney infection. *Wounds of the peripheral nerves* should be sutured, provided this can be done without tension when the wound is excised or cleaned, and the limb splinted to rest any muscles paralysed as a result of the nerve injury. *Wounds of the face and jaw* should be cleaned and passed as soon as possible to a plastic surgeon accustomed to dealing with this type of injury. Injured *blood-vessels* should, as a general rule, be divided and ligated above and below the site of injury and no attempt made to reconstruct their lumen. Such attempts are dangerous and likely to be followed by severe secondary hæmorrhage, should the wound become infected, and the ultimate results are unsatisfactory.

ROUTINE TREATMENT IN CLEARING HOSPITAL

The treatment of war wounds involves care of the patient from the time of infliction of the wound until the end-results have been attained, but in this article it is intended to deal mainly with the treatment which such cases should receive at the first hospital to which they are admitted, and from which they will probably have to be removed in a few days or earlier to make room for succeeding casualties from further air-raids.

It should be the aim to keep patients for 3–8 days at the clearing hospital, but this may be impossible owing to the number of casualties or the exigencies of transport, and the medical officer should select the cases to be evacuated prematurely, should such conditions arise. These clearing hospitals will presumably be established in existing hospitals in the metropolis and will be organised with a number of surgical teams on the lines suggested in the first article of this series. All cases admitted must be treated when necessary for shock—briefly, this consists of giving fluids by mouth, or intravenously in severe cases, in which continuous blood-transfusion is of great value. All wounded patients must receive a prophylactic injection of tetanus and gas-gangrene antitoxic serum. A combined injection is obtainable, and for the average case an injection containing 500 units of tetanus antitoxin, 400 units of *B. perfringens* antitoxin, and 400 units of *vibrion septique* antitoxin should be administered. When wounds are obviously fouled with road dirt or manure, four times this dose should be administered hypodermically, and this treatment and any other given must be recorded on the patient's medical card at the time of administration, so that, when he is transferred to another hospital, it may be known what treatment has been given.

It cannot be too strongly impressed upon the young surgeon that every wound, however trivial, must be completely and thoroughly explored, for the vagaries of bullet tracks are many, and until such exploration has been carried out it is impossible to tell the exact course of the projectile, or what damage has been inflicted to subjacent viscera. Hence in the case of minute wounds of the abdominal parietes laparotomy is often necessary and must always be performed if any doubt exists about penetration of the abdominal cavity. In the case of lacerated wounds care must be exercised in the *débridement* lest important anatomical structures be damaged, and when such damage is found it must be repaired as far as possible by suture of nerves, ligation of vessels, and reduction and splinting of fractures, efficient drainage being provided in every case.

RADIOGRAPHY

If time and circumstances permit, radiography should be carried out as a routine in all cases of wounds by projectiles, to ascertain if fragments have been left behind and to locate their position. For this purpose there should be one or two X-ray units at each clearing hospital. It will seldom be possible or advisable to carry out these X-ray examinations before performing the routine wound toilet, but every effort should be made to radiograph head wounds before operation. When small fragments are deeply embedded in the tissues and cause no apparent trouble, it is advisable to leave them in situ rather than to undertake extensive operation, the successful results of which are problematical, and usually negligible compared with the damage done to the body tissues. All cases of both simple and open fractures should be radiographed after they have been splinted, and all cases of dubious fractures must be radiographed to establish a diagnosis, though this procedure may be impossible during rush periods or when it may only be possible to adjust splints, if necessary, before transferring these patients elsewhere. A proportion of X-ray units should be mobile.

ANTISEPTICS

The application of antiseptics to the two ends of a penetrating wound cannot affect the track of the wound, and this is on the whole a good thing, for in our experience the use of antiseptics in sufficient strength to destroy micro-organisms has a most deleterious effect on the already damaged tissues. As a general rule, therefore, antiseptics are strongly contra-indicated in wound surgery, for experience shows that antiseptic dressings cause more damage to the tissue cells than to the micro-organisms and thus encourage the spread of infection. The use of coloured antiseptics may be justifiable in following through the track of a projectile and can be used as a first-aid dressing when efficient cleansing is out of the question, but in such cases only a mild antiseptic should be used, such as a 1 per cent. aqueous solution of gentian violet or a 1 in 1000 solution of acriflavine or brilliant green, which are painless and non-irritant. The use of that popular and painful antiseptic 2·5 per cent. iodine in spirit is mentioned only to be condemned.

ANÆSTHESIA

Anæsthesia will be necessary in the thorough excision and cleansing of all wounds, and for any patient suffering from loss of blood, shock, and low blood-pressure some form of stimulant anæsthetic is necessary. For this purpose a hypodermic injection of morphine gr. $\frac{1}{6}$–$\frac{1}{4}$, together with atropine sulphate

gr. 1/100, is a valuable premedication and allows the operation to be conducted under gas-and-oxygen anæsthesia. Should deeper anæsthesia be required, as in laparotomy or thoracotomy, ether can be administered. In no circumstances should spinal anæsthesia be used in such cases, for the resultant fall of blood-pressure is very hard to combat and often fatal in already feeble patients. Local anæsthesia is inadvisable, for the œdema consequent on the local infiltration in the area of the wound favours the growth of micro-organisms and retards healing. Nerve-block may be possible, but it is difficult to foretell the exact area of operation, and the patients' mental condition is usually such that it is preferable that they should be unconscious of what is going on round them. Chloroform (except in hot climates) must not be used to anæsthetise such patients if it can be avoided, for the risk of cardiac failure is very great. As a general rule most of the wounded patients undergo anæsthesia extremely well and cause but little anxiety to the anæsthetist, provided he administers only gas and oxygen, supplemented if necessary with ether.

The apparatus must be compact and simple, and portable if possible, such as the apparatus of Shipway, Boyle, or McKesson, or some modification of these. A large reserve of cylinders of gas and of oxygen must be kept handy, but these should be stored outside the theatre and in such a place that they are unlikely to be exploded by a bomb falling in the vicinity. A cylinder of oxygen and carbon dioxide should also be available and a few inhalations from this given to every patient as a routine at the termination of anæsthesia to reduce the incidence of lung complications and, by inducing deep breathing, to promote a more rapid recovery from the anæsthesia. The anæsthetist's equipment must include gag and tongue clips, intratracheal catheters and Hewett's airways, as well as a ready sterilised hypodermic syringe and needles and ampoules of such restoratives as Coramine and strychnine. It is a wise precaution to place a drop of castor oil in each eye before the patient leaves the theatre, for this greatly diminishes any risk of post-anæsthetic conjunctivitis. In many cases the patient will be returned to the ward to be nursed by V.A.D.'s or orderlies, and it will be necessary to instruct these in turning the patient's head to one side and keeping the jaw forward so that the pharynx may be kept clear when the patient vomits.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM A PHYSIOLOGIST IN AMERICA

III

Nov. 23—Getting colder: severe frosts at night, but a fortnight ago sat outside in the garden reading all day—and they complain of the weather. The days are generally sunshiny and bracing, the cloudy days muggy and warm. Last week it snowed.

Dr. S—— insisted on my accepting two tickets for Saturday's Yale *v.* Harvard football match, so B—— and I caught the early train to Boston. He is another Englishman and we passed the journey comparing notes and seemed to arrive quickly at our destination. Boston station, like most I have seen, is magnificent and spotlessly clean. It is important in this country to differentiate between the "station" and the "track." We had a cup of coffee, and descended into the subway where we were packed tight and trundled off to the Stadium. We arrived a little late, but found our seats without difficulty—two numbers painted on a plank. They certainly don't pander to the comfort of the spectators; it was the same at Yale. Unlike the Yale Bowl, which is quite open all over, this horse-shoe-shaped structure is topped by a roof, covering the upper half-dozen or so rows of seats, and supported by pillars. It is there only for architectural effect and certainly does look rather fine. We were miles away from the pitch, but could see perfectly. Yale never had a look-in, and suffered their first defeat of the season. Rather bad luck, as it was the last and most important game. Football stops now, probably owing to the imminence of winter, or perhaps because all the players get used up just about now. A snowstorm came on and lasted all through the second half. We buttoned up our coat collars and stuck it like Spartans; many of our companions drank whisky as well and became steadily more partisan. (Even girls take their spirits "straight.") The game, unlike the previous one, was quite interesting, and included a lot of open play. The Harvard team were magnificent, making their 10 yards time after time, and their two scores were beautifully clean. Yale relied too much on brute force, and came off very much second best. They were lucky to escape with their 13–6 beating.

The significance of university football is rather difficult for us to understand. The seats are quite expensive, and the game may be played before anything up to 80,000 spectators—very much like our professional games. Whether the money goes to the university, or the football club, or into some special fund I don't know, but I gather vaguely that it is almost essential for a university to have a first-class team and that some people think it is not all for the best.

* * *

It is a coincidence that on the same day as writing up a good football match I have also to report a proper tea. We went to H——'s this afternoon, where "pouring out" was done in the good old-fashioned way. All the departmental wives were there, the husbands dropping in by ones and twos. We sat round the apartment and yelled at each other until it was time to leave, happy but exhausted. Marjorie was quite one of us, and solemnly produced a little basket she had made at school and passed round pea-nuts! As a matter of fact, I find that tea is not quite so unknown here as I thought. Two or three people make it in their labs, and in a tremendous lounge in the medical school there is a daily function, presided over by wives of prominent members of the teaching staff, at which tea is dispensed from silver urns and "cookies" distributed. The only un-English features about this are first, that it is free, and secondly that it is free to all—staff, students, and nurses. I believe it is unique, and not a national custom.

* * *

Nov. 29—Last Wednesday I spent all morning cleaning out mouse cages, and in the afternoon we

set out for New York where we were to spend Thanksgiving. It is curious how one comes to take these strange festivals for granted. I believe Thanksgiving has some connexion with harvest, but I have never troubled to consult any written authority. At all events, it is just as important as Christmas over here, and is the season of family reunion. We united with the C——s in New York, who were among the thousands of people meeting our train. Fortunately they spotted us. Thursday was actually Thanksgiving Day, and was as nearly like our Christmas as to need no description.

On Friday we explored a little of New York, adopting the time-honoured method of getting on top of a 'bus to begin with, just to loosen the muscles of our jaws and allow our eyes to swell gradually. Manhattan is neatly divided into rectangles, 11 or 12 "avenues" running from north to south, and about a couple of hundred "streets" running east and west, with Central Park in the middle. Fifth Avenue runs approximately up the centre of the island, so we followed it from its business end in the south to its residential part overlooking the park . . . then round the north of the park and right across westwards to Riverside Drive, which flanks the Hudson River and is set with trees and gardens. Its chief virtue is that it is not straight. On a clear day there must be a wonderful view across the wide river from its numerous apartment houses. Here we found Grant's Tomb which for some reason I expected to be rather funny, but it was a most sedate and imposing edifice. . . . Made our way east again along rather dingy streets, lined with residences of varying attractiveness and numerous garbage bins (full), and came once more in sight of the park.

At this point we investigated a fraction of the Natural History Museum which made me feel that I had perhaps insufficiently cultivated the museum habit. We saw among other things a section of one of the Californian sequoia trees over 16 ft. in diameter. It started growing about A.D. 500. We thought of stealing it for a dining-table, but decided it would not fit into our dining-room without removing at least three of the walls. What interested us most was Beebe's original bathysphere—the hollow metal sphere with quartz windows in which he was lowered into the depths of the sea. Personally, I should hate to be shut up in it for five minutes, with or without oxygen and soda-lime. There is not enough room in it in which to stand upright, and of course no room for anything to sit on. The manhole by which one enters has to be bolted tightly in position, and the whole is suspended by a slender wire cable.

Outside, the buildings at the south end of the park looked fairly near, so we decided to walk. We walked for what seemed like miles, but the buildings receded before us. Considering that they were as high as a range of small mountains it was not surprising, but it became very tiresome. The fact of the matter was, it was too hot, in spite of being the end of November. However, we were stimulated by finding Broadway at the corner of the park, cutting diagonally across the city in a most unconventional but refreshing fashion, and lunched at the nearest "Child's." We felt rather as though we were taking part in a film; everything was new, but vaguely familiar. There is no doubt about the value of the cinema in spreading civilisation.

Impelled by the urge to see as much as possible, we decided to mount a skyscraper. The R.C.A. (Radio Corporation of America) building is nowadays considered to be all that a skyscraper should be, though it is not the largest in the world, so with some trepidation we entered a door which would have made a nice frame for our house at home. Inside it was still New York, only the sky being absent. There were marble streets of shops, restaurants, exhibitions, telephones, and a large post office. It would be possible to live there without ever seeing the light of day. A passage led to the biggest music hall in the world, and all that was lacking was a church and a cemetery. In view of the possibility of getting physically so near to Heaven, perhaps the former does not rank as a deficiency.

We were rather surprised that we were allowed to go up in an elevator without a written introduction to the operator, but he accepted us as a matter of course and lightly flung us up to the 40th floor in less time than it takes to write it. After that, passengers began to leak out at every five or six floors. At the 65th floor we were relieved of 40 cents each before being allowed to the 70th floor and so to the roof. The view was not fifty miles in extent as it should have been, because the day was not quite clear, but we could see most of Manhattan. The slight haze lent a good deal to the picture of the great skyscrapers. The highest in the world is the Empire State Building (1250 ft.). Ours was the fifth highest in New York, being only 850 ft.; we could feel a slight shock as gusts of wind struck the building, and wondered how on earth they made the things stand up. Still, there they are, and they defeat description. People can say what they like about the ground floor of New York, with its noise and incongruities, but up here one feels that man has gone one better than nature. (I can hear some of my friends snorting loudly about the top of the Chrysler building, but anyone standing on top of the world and peering at this ornate pinnacle has no soul.)

To gaze on these aspiring clusters of graceful, delicately poised needles, to think that they are really stupendous columns of masonry, reaching proudly, albeit a little wistfully, into the sky, is to uncover for a moment the core of the American character. What homesick emigrant could fail to take heart at the sight of this man-made miracle? "Be of good cheer, be strong, and triumph!" it shouts. As a child bursts into activity on being released from school, just to show itself that it is really free, so an enthusiastic and unfettered people spontaneously flings its mighty monuments to the sky.

Before we came to earth the setting sun broke through the clouds, and a beam of light lit up a stretch of the Hudson River which shone for a moment like gold. We left the skyscrapers gradually fading into the heavy atmosphere and reappearing as cascades of light. . . . We descended at the rate of one floor in three-quarters of a second.

* * *

Coming out of the R.C.A. building we fell into the trap which always awaits the stranger in these rectangular cities. We set off walking briskly eastward in the firm belief that we were travelling in precisely the opposite direction. By the time we had found out our mistake and retraced our steps, we were too late for the 4 o'clock performance at the Hayden Planetarium, and had to wait for three-quarters of an hour. In the interval we explored the building and were somewhat awed at the large number of meteorites which were assembled in the circular corridor. One of them was a trifle of apparently solid iron weighing about 35 tons, and none was negligible from the mere pedestrian's point of view. I heartily approve of the habit these things have of falling in unfrequented spots.

In the centre of the building on the first floor we found a room with the sun in the middle of the ceiling and the planets sweeping round it on little railroad tracks. Round the planets careered their little moons, looking rather fussy, but obviously enjoying making the parent body dizzy. One of them had a particularly annoying and disrespectful trick of chasing round faster than its planet was rotating. We had a wireless lecture on the planets, and then went up to the next floor into another large circular room covered by a great dome-shaped ceiling. In a pulpit at one side was the lecturer, an erudite gentleman who subsequently entertained us by describing the various ways in which the end of the world might come. If it is as terrifying as some of the acts he put on to illustrate his meaning, I shall be more than content to have ended first. The audience sat solemnly round an impressive-looking apparatus in the centre of the floor, rather like a telescope with multiple tumours, and held hands while the lights slowly faded and the silhouette of New York round the edge of the roof gradually became indistinguishable. Then above us the night sky suddenly appeared, perfect in every detail and a cool breeze played round us. Whether this was stage-management, autosuggestion, or merely a draught I don't know, but it was impossible to realise one was not outside on a clear starlight night.

The sky was a deep unfathomable blue, and all the stars were there, even to the Milky Way. We didn't count them, but I'm sure even the smallest had not been overlooked (the apparatus is of German manufacture). As for imagining that the whole thing was just several slabs of concrete, nothing could have been more ridiculous. A luminous arrow played round the firmament, several million light-years away, and obligingly indicated the stars and constellations referred to by the magician in the pulpit. I should have liked a sober demonstration of how the night sky changes during the year, but we were treated to much more sensational fare. First of all, we had a dizzy journey through space or time or both to a distance of several thousand centuries. Apparently the earth wobbles a bit on its axis, and while this is reassuring politically, it would be rather disconcerting to come back and find the Southern Cross definitely out of bounds and the Pole Star on strike. This is what happened, however, and North was definitely somewhere else. Next, by some obscure process, we seemed to be a long way from the sun, which appeared as a small star; I suspect we were now disembodied spirits floating about in space. However, when the sun collided with Alpha Centaurus we were in at the death, for it was accompanied by a bang and a blinding flash of light. We were shown comets, meteors in full flight, and finally a demonstration of the moon charging at us with dire effects. The sky rocked, the wireless played very loudly, but the victory was ours for the moon broke up, with brilliant sunset effects, into a cloud of particles. The sky settled down, the music became soothing, and a luminous band stretched across the heavens from horizon to horizon. Saturn must have fun at night.

It was quite a relief to get outside into a shower of rain, and to travel down Eighth Avenue in a good honest 'bus. . . . And so home.

PANEL AND CONTRACT PRACTICE

Relation between Doctor and Patient

IN the *National Insurance Gazette* of Jan. 12 a correspondent gives particulars of a case that raises questions of special interest not only to insurance administrators but to the medical profession and the public. It appears that an insured person on the list of Dr. A sustained an injury to his foot in November, 1937, and was certified week by week as incapable of work by Dr. A or by Dr. A's son and partner, Dr. B. The patient came to the surgery regularly for examination, and on April 13, 1938, he was examined by Dr. B, who gave him an intermediate certificate of incapacity, and, in respect of the same examination, supplied the insurance company with which the patient's employers were insured against workmen's compensation risks a report to the effect that the patient was fit to resume his employment. The patient applied to his approved society for assistance in pressing his claim for compensation, and the society referred him to a specialist, who reported that he was not fit for work and needed manipulative and massage treatment. The case was brought by the society to the local insurance committee, and, on appeal, to the Minister of Health, who, it is stated, decided that there was no breach of the certification rules in respect of the certificate issued on April 13.

The case presents points of interest apart from any question of the legal obligations imposed upon insurance practitioners by their contracts with insurance committees. The doctor in his capacity as insurance practitioner, in which his obligations are defined by contract, gave his patient a certificate of incapacity for work, and in another capacity he gave an insurance company, a third party, a professional opinion to the contrary effect. It is often contended that in the British health insurance system, in which the insurance doctors are not state officers but private general practitioners giving part-time service under contract with the insurance committees, the intimate and confidential relation of doctor and patient is preserved and interference of outside agencies is reduced to a minimum. The importance of this relation is emphasised in the B.M.A.'s plan for a General Medical Service for the Nation, in which it is stated that—

"The relations between doctor and patient are so intimate that both doctor and patient rightly resent any outside interference. . . . The patient . . . is a sick person whose cure depends very largely on complete confidence in the doctor, and this confidence is built up to a great extent on psychological factors which are disturbed by the intrusion of outside agencies. . . . The patient should be able to feel that the doctor is his doctor, acting whole-heartedly and independently on his behalf."

In this case there was a remarkable "intrusion of outside agencies," not into the doctor's insurance practice, where his duties are defined in his contract with a third party, but into his private practice, where he was acting, in this matter, with perfect freedom. The case seems to furnish ammunition for the advocates of an insurance medical service of whole-time officers, remunerated by salary and debarred from accepting fees. Whatever the disadvantages of that kind of service may be, it would at all events safeguard insurance doctors from any inducement to express contradictory professional opinions on the condition of a patient.

PUBLIC HEALTH

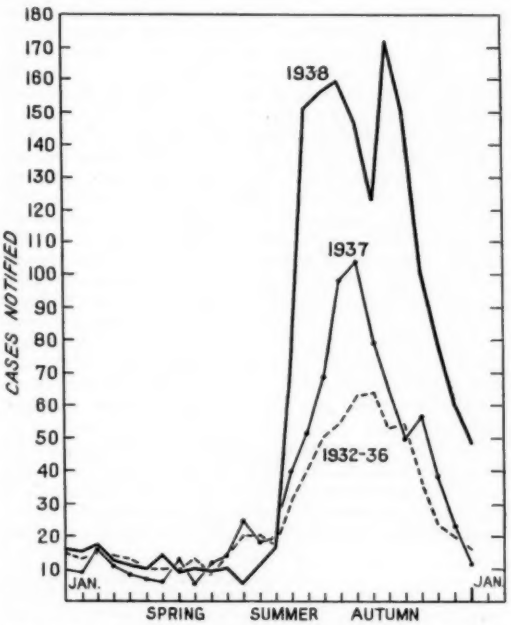
Pneumonia and Influenza

THE Registrar-General's weekly reports show that the number of deaths attributed to influenza in the great towns of England and Wales has increased considerably in the last few weeks. In the first half of December, 1938, the weekly total was some 20–30, in the week ending Dec. 24 it rose to 41, in the last week of the year to 89, and in the first week of 1939 to 144. At the same time notifications of primary and influenzal pneumonia have been approximately doubled, rising from 700–800 cases at the beginning of December to 1668 in the week ending Jan. 7, 1939. An increased incidence of pneumonia is, however, normal at this time of year and the present level is roughly what might be expected on the basis of the experience of the last few years. In other words the position with regard to pneumonia has become much less favourable both as regards its absolute incidence and its position in relation to the expected figures, but is still not in excess of the latter. In London its incidence in relation to expectation remains low and a very large proportion of the deaths attributed to influenza are from the northern towns, especially Liverpool and adjacent areas. At the moment it is clear that there has been no dramatic change in notifications or deaths indicative of a real influenza epidemic, but the development of such cannot be ruled out. It is possible, on the other hand, that the present change is the result of an increased incidence of pneumonias following infections of a more indefinite nasopharyngeal type.

The Incidence of Poliomyelitis

One of the distinct features of the experience of acute poliomyelitis in England and Wales during the past year was the double peak in the curve of incidence. The rather sharp rise in notifications that occurred about the middle of July, and originated, it will be remembered, in Essex, led to a maximum figure of some 80 cases a week in the second and third weeks of August. There was then a small but distinct decline to 55–65 cases a week at the end of September and beginning of October. This, however, was followed by a secondary rise to a weekly incidence of over 80 cases in the second and third weeks of October. Since the beginning of November notifications have shown their normal seasonal decline, but as might be expected with an outbreak that became widespread the level has remained appreciably above that of recent years.

In the accompanying table and diagram the fortnightly incidence is compared with the corresponding average figures for 1932–36 inclusive and for 1937. The conclusion previously reached (see *Lancet*, 1938, **2**, 1083) still appears to be valid—namely, that judging by the course of events in 1926–27 it would be optimistic to hope for a speedy return to the usual low levels. Here and there about the country a new focus still seems to be cropping up, as at Wellington College in mid-December (*Lancet*, Jan. 7, 1939, p. 51), and it is not unlikely that 1939 may also show an enhanced incidence of the disease, though on a lower scale. Actually during the first week of the new year (ending Jan. 7) 22 cases were notified compared with the half-dozen or so sporadic appearances normally observed at this time of year. In 1938 1485 cases of acute poliomyelitis and 97 of polio-encephalitis were recorded, giving a total of 1582 notifications, to be compared with 861 in 1937 and an annual average of 700 in 1932–36. The final record of 1938 is therefore about double the customary levels of recent years and also well above the highest figure previously recorded—1159 cases of acute poliomyelitis and 138 cases of polio-encephalitis in the epidemic of 1926.



Number of notifications of poliomyelitis and polio-encephalitis (combined) in fortnightly periods.

NUMBER OF NOTIFICATIONS OF POLIOMYELITIS AND POLIO-ENCEPHALITIS IN FORTNIGHTLY PERIODS

Fortnightly period	Mean figure for 1932–36	1937	1938	Fortnightly period	Mean figure for 1932–36	1937	1938
1	15	10	16	14	16	19	16
2	13	9	15	15	32	40	70
3	15	16	17	16	40	52	151
4	14	11	13	17	51	69	156
5	13	8	11	18	55	98	159
6	10	7	10	19	63	104	147
7	10	6	14	20	64	79	123
8	10	13	9	21	53	65	172
9	13	5	10	22	54	50	150
10	8	12	9	23	36	57	101
11	14	14	10	24	24	39	78
12	20	25	5	25	20	24	60
13	20	18	11	26	16	11	49

The Registrar-General's latest mortality returns (Medical Tables, 1937; see *Lancet*, Jan. 7, 1939, p. 50) show that in 1937 there were 152 deaths tabulated as "acute poliomyelitis," of which 94 were debited to acute poliomyelitis itself and 58 to acute polio-encephalitis. These figures give the ratios of deaths

to notifications in that year as roughly 1 in 8 for acute poliomyelitis and 1 in 2 for polio-encephalitis.

London's Underground Water-supply

At one time an important proportion of London's water came from underground sources, and a memoir issued this week by the Department of Scientific and Industrial Research [1] describes over 1000 wells in the London area, of which half are now disused. Of the 37 gallons per head that the Metropolitan Water Board distributes only half a gallon now comes from wells, and in addition some 4½ gal. per head is drawn from private wells, mainly for industrial purposes.

In the earliest times water was drawn from the Thames and from the brooks which flowed through the growing town into the river. After 1236, water was supplied to the City in conduits from wells and springs outside the populated area, the first of these being a spring at Tyburn on the site of what is now known as Stratford Place, Oxford Street. Additional supplies were later carried in conduits from Paddington, Hackney, and Hampstead. In 1582 a pump worked by water wheels was erected on London Bridge and forced water from the Thames to the City. The New River system was opened in 1613. At the beginning of the seventeenth century most of the streams through the town had become choked and partly buried, and only a few of the public wells, such as Holywell and Clerkenwell, remained. About this time the first deep wells were opened, while in the nineteenth century supplies began to be taken from the Thames and its tributaries outside London. These external surface sources now provide most of London's water.

The early shallow wells were sunk in the sands and gravel which form terraces rising from the Thames. Rain, or water draining from springs in the adjacent hills, for example from the Bagshot sands at Hampstead and Highgate, filtered through these gravels until stopped by the impermeable London clay beneath, where it collected. When the water from the gravels became polluted, wells were sunk through the London clay to what are called the Reading beds and Thanet sands, where the water was under considerable pressure and rose in truly artesian fashion. In places the Reading and Thanet sands still contain water, but to the north they are now dry. Today the chalk below the sands constitutes the most important water-bearing bed under London, but not all its water can be easily removed. Chalk is like blotting-paper: it can absorb a quantity of moisture that cannot be released without great pressure or high temperature, neither of which can be applied in nature. As in the sands above, the water-level is falling, and this has rendered many of the shallower wells useless. For example, wells close to the National Gallery used to supply the fountains of Trafalgar Square and many of the public buildings in Whitehall as well as the old Millbank Prison and the Houses of Parliament. In 1844 the water-level was 68 ft. below the Ordnance Datum, in 1911 it had fallen to 195 ft. below, and soon afterwards the wells were abandoned.

The general lowering of the water-level below London is due to the fact that water is being extracted more rapidly than it can be replenished by the extremely slow flow that is possible under the existing subterranean conditions. Pumping and the competition for water has become increasingly intense within the inner zone of London, and there are now twice as many wells in operation as in 1911. A considerable number of new wells have also been bored at the outcrop of the chalk and are removing large quantities of water which otherwise might travel towards the centre of London. At the same time land drainage over the surface of the outcrop has been rendered more effective and the amount of water available for absorption in the underground strata reduced. In addition, extensive building over the areas outside London, where the chalk comes to the surface, has diminished the catchment, thus extending outwards the distance through which the water absorbed must travel to reach the centre of the London basin. Finally, the amount of rain contributed to the chalk and sands has seriously decreased during recent periods of drought. Most of the factors which have reduced the level of the water are likely to continue, so that there seems little chance of the recovery of the water-levels. Hopkinson calculated in 1891 that if the whole of the water in the chalk of the London basin were exhausted it would require 400 years' rainfall to fill it again.

[1] The Water Supply of the County of London from Underground Sources. H.M. Stationery Office. 6s.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 7, 1939

Notifications.—The following cases of infectious disease were notified during the week: Smallpox, 0; scarlet fever, 1394; diphtheria, 1180; enteric fever, 30 (23 "expected"); pneumonia (primary or influenzal), 1668; puerperal pyrexia, 128; cerebro-spinal fever, 22; acute poliomyelitis, 24; encephalitis lethargica, 6; dysentery, 27; ophthalmia neonatorum, 72. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Jan. 13 was 3208, which included: Scarlet fever, 579; diphtheria, 1088 (carriers, 45); measles, 13; whooping-cough, 644; puerperal fever, 8 mothers (plus 3 babies); encephalitis lethargica, 297; poliomyelitis, 5. At St. Margaret's Hospital there were 27 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In 126 great towns, including London, there was no death from smallpox, 1 (0) from enteric fever, 3 (0) from measles, 4 (0) from scarlet fever, 14 (6) from whooping-cough, 23 (2) from diphtheria, 43 (13) from diarrhœa and enteritis under two years, and 144 (3) from influenza. The figures in parentheses are those for London itself.

Blackpool reported the only death from typhoid. Fatal cases of diphtheria were scattered over 18 great towns, 3 at Liverpool. Of the 144 deaths attributed to influenza 98 were reported from the northern area, Liverpool contributing 32, Birkenhead and Manchester each 6, Crosby, Hull, Southport, and Wallasey each 4.

The number of stillbirths notified during the week was 264 (corresponding to a rate of 39 per 1000 total births), including 43 in London.

"... The oceanic island work, at least, must be done soon or never. Islands comprise the most delicate and evanescent of environments for their native biotic communities as soon as civilized man and his satellites put in an appearance and proceed to upset the ancient balance. The list of organisms that have become extinct within the historic period fairly bulges with the names of astonishing island birds, from the dodo of Mauritius to the mamo of Hawaii. All the peculiar land birds of Tristan da Cunha Island, in the South Atlantic, have become extirpated since the introduction of hogs and rats. The remnant of the fauna of Tahiti is waging a rapidly losing struggle against domestic mammals, alien hawks, mynahs and weavers that have become established there, and against the wild-fire spread of lantana and other weeds that have already dispossessed much of the original vegetation. The same story is being repeated elsewhere; primitive conditions that may have flourished for a million years melt away when men of the dominant races, whether white or yellow, arrive to break the spell."—R. C. MURPHY, *Science*, Dec. 9, 1938, p. 533.

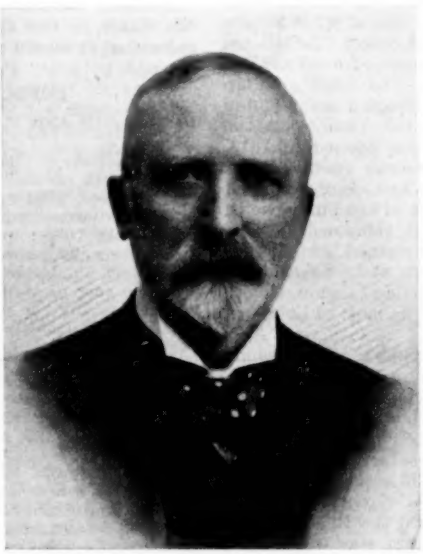
OBITUARY

JAMES RUTHERFORD MORISON

M.B., LL.D. EDIN., D.C.L. DURH., F.R.C.S.

THE death of Prof. Rutherford Morison took place at Newcastle-on-Tyne on Jan. 10, in his eighty-sixth year, and his loss will be widely mourned, at home and abroad, for he had been recognised as a leader in surgery for more than half a century.

James Rutherford Morison was the son of Dr. John Morison, and was born in 1853 at Hutton Henry, near Castle Eden, co. Durham. This was then on the fringe of colliery districts and he grew up with a love of the country and an understanding of the work of the colliery doctor. He studied medicine first in Birmingham and then in Edinburgh, where he qualified in 1874. His father's early death left him with several sisters and brothers to educate and he went straight into practice at Hartlepool, where he soon became physician to the hospital. Even then his passion for surgery was so strong that he did more operating than the rest of the staff put together. He found time to take the primary F.R.C.S., and to go to Vienna where he came under the spell of Billroth, then at the height of his fame. After fifteen years of general practice he moved to Newcastle and in 1888 he was elected assistant surgeon to the Royal Infirmary, under W. C. Arnison who then held the chair of surgery. From 1897 onwards he was full surgeon, until his retirement in 1913 on reaching the age-limit. Morison was a popular teacher in the medical school long before he succeeded in 1910 to the chair of surgery, which he held until 1921. All these years he had an extensive surgical practice, ranging over the whole of the northern counties. He was one of the earliest surgeons to limit himself to consulting work and to run a private hospital—he would not have it called a nursing-home. Dene House and Gresham House, where he operated, were well-known names in those days. In early life he walked or cycled to his consultations; for a time he used a motor-bicycle, which cost him a broken humerus. Later on his big Sunbeam car, with Mat the chauffeur, was often seen carrying patients to hospital or nursing-home irrespective of time and distance.



[James Bacon, Newcastle

Morison was a general surgeon in the widest sense and there were few fields that he did not essay with success. In the late 'eighties he was doing gastrectomies and colectomies, and it was he who introduced the method of removing a growth from the lower colon by producing intussusception with an anal tube. In 1904 two of his patients made good recovery from partial cystectomies. But it was not only in the surgery of carcinoma that he was a pioneer. He was one of the first to advocate treating fractured patella by open operation and catgut suture, and he regularly operated for torn semilunar cartilage. His radical removal of cancer of the breast was wide and complete. His name, with that of Drummond, is associated with the operation of omentopexy for the radical cure of ascites; the Dutch surgeon Talma had also conceived the idea of a new collateral circulation, but it was Morison who had the first success. Long before Crile described his method of clearing the neck Morison was doing elaborate dissections in all cases of malignant disease of the lip or mouth. In his later days he became surgeon to the Sanderson Home for Crippled Children, where he organised a surgical service and did much orthopædic work. He was consulting surgeon to the Dental Hospital, and after the war to the Pensions Hospital. For a time he acted as staff surgeon in the R.N.V.R. In 1915 his services were sought for the war hospital founded in the Newcastle city asylum, and there he built up a modern surgical clinic. Having been wedded to antiseptic surgery for so long, it was remarkable to find him then developing there a dry-sterile technique, amply justified by results. In the search for some sort of depot antiseptic he hit upon the idea of using the paste of bismuth, iodoform, and paraffin which, under the name of B.I.P.P., was widely used during the remainder of the war and since.

Morison was always a keen supporter of the British Medical Association; he was regular in his attendance at the surgical section of the annual meetings, and when the association met in Newcastle in 1921 he was president of the section. He was also an ardent supporter of the old Northumberland and Durham Medical Society and for a long period edited its transactions. In the early 'nineties he induced these bodies to hold formal postgraduate classes, which were continued largely by his efforts until the obligation was accepted by the college of medicine. He was always a considerable writer; a selection of his earlier writings was collected in two large volumes (1881–1916) entitled "Surgical Contributions." His "Introduction to Surgery" (1910) was reissued more than once, with the assistance of his old pupil Prof. C. M. Saint. Best of all perhaps was his "Abdominal and Pelvic Surgery for Practitioners" (1925). Though never fond of administrative or academic duties he did his share of committee work. For years he examined in the University of Durham and he was outside examiner in the Universities of Liverpool and Birmingham.

Morison was a great chief. All his assistants were agreed about this and loved him. But everyone who really knew him realised that he was a dictator, and as such he was revered more by the younger men than by colleagues He was more than a great teacher and pioneer surgeon; he was a maker of surgeons and

many of his pupils are now occupying important surgical posts in various parts of the world. In private life he was one of the most generous of men and many a poorer colleague had reason to remember his kindness of heart; it was characteristic of him that even his generosity was spontaneous but totally undisciplined. In his most active years he was fond of shooting and fishing, and after his retirement he took up golf though he never became adept. The country always appealed to him. After leaving Newcastle in 1924 he went to live at St. Boswells on the Tweed, where he had a country home for many years. But he could not be inactive and soon took up farming, trying out many of his own ideas. It was there that on his eightieth birthday a group of his old house surgeons gathered round him to convey their congratulations and to present him with an easy chair. To the end he was loyal to surgery, reading the surgical journals or the newer books and discussing them with his younger friends—often to lay down the surgical law in no uncertain terms. His last years passed happily with the devoted care of a niece and until his final illness he enjoyed good health.

He was twice married, but for many years he had been a widower. He is survived by a son of his first wife and three children by his second marriage, one of whom is Dr. C. R. Morison of Harrogate.

Prof. Grey Turner, who was Morison's house surgeon and private assistant, writes: "One of my early recollections of him is when he was visiting the dissecting-room and found me examining the roots of the lumbar plexus. 'What huge foramina for such small nerves,' he remarked, 'I wonder what the reason can be'; and this inquiring habit of mind I came to associate with Morison throughout the whole of his life. He insisted always on the study of principles and the importance of careful observation and diagnosis. Asked what book he would recommend on treatment he replied that what was required was diagnosis; if only that could be made, the question of treatment was easy. When I was house surgeon it was his habit to visit the hospital every day, including Sundays, reporting at the porter's lodge at 10 A.M., and leaving about 1 P.M., except on his three operating days when it was often 2 to 3 P.M. before he got away. Sometimes he came down in the evening for emergencies but never after bedtime; for, as he said, he had had such a scunner of nightwork in Hartlepool that he never wanted to be disturbed again! For the same reason he could never be got to fill any engagement before 10 A.M. On his operating days he never stopped for lunch although he might drink two or more glasses of milk in the course of the day. In the wards he made a point of seeing every case and took the keenest interest in their pathology. He attended the post-mortem room not only for his own cases but whenever any examination was to be made. At one time he saw and examined histological sections of all his tumour cases.

"At Edinburgh he had dressed for Lister and was house surgeon to Patrick Heron Watson, whom he regarded as one of the finest operating surgeons he had ever seen. During his early surgical life he was wedded to the antiseptic technique. I remember him telling me that on one occasion when the spray broke down he covered the wound with a carbolic towel until a cab could return from his house with another spray; and he did not discard this part of the Listerian ritual until he had satisfied himself by a personal visit that Lister had done so himself. He was always punctilious in the application of the technique in which he believed and in that lay probably the secret of his success. At the same time he was always trying something new, although he would never travel to see any other surgeon at work for fear, as he once told me, of losing his individuality. But he used to send me to other clinics to report on what I saw, and in later years, as a member of what is now the Moynihan Surgical Club, he paid regular visits to surgical centres, British and foreign.

"But teaching was his great delight; he regarded it as a sacred duty and he never missed an opportunity of using the ample material always associated with the Newcastle school. He was at his best in the outpatient room or at the bedside and as a clinical lecturer. He did not enjoy formal lecturing. He had ideas about the future of the medical profession and in many ways was much in advance of his time. Early experience in general practice had made him realise the evils of the club system and he supported every effort of practitioners to improve the conditions of their work. Sometimes he was an over-enthusiastic reformer. I have a vivid recollection of the consternation at a medical meeting when he alleged that consultants were doing general practice. 'If that is not so,' he said, 'what do they do with their carriages?' He was a believer in group medicine and looked forward to institutions where patients of all classes could come for advice from a team of well-trained workers. Such a scheme, formulated and worked out in his mind, was so familiar to me that it came as a shock of surprise, on visiting the Mayo Clinic in 1906, to find there in being what Morison had always envisaged."

THE LATE PROF. WINGATE TODD

Prof. Woollard writes: Wingate Todd was a large man and his industry was amazing. During vacations he would rise at 5 A.M. and work until the household and the guests (he had adopted completely and easily the American ideas of hospitality) straggled in to breakfast. He was always the most eager for expeditions, walks, swims, and the like, and when the rest of the house had gone to bed he would start work again. His literary and scientific output, both of formal communications and less formal addresses, was prodigious. His main interest was in the growth of the body; and by growth he meant not merely increase in size but also the orderly sequence of development. His approach to this major theme began with his work in the anatomy department at Manchester under Elliot Smith. Todd's first researches were concerned with the condition of cervical rib, and it was the consideration of this anomaly that revealed to him the need for an accurate knowledge of the successive phases in the growth of the structures of the body.

For such a research time, money, and material were necessary. The opportunity of getting these and so making a start upon an adequate scale came when he was appointed head of the department of anatomy in Western Reserve University, Cleveland, Ohio. Through his unceasing drive the Hamann museum of that university became the largest single collection of human skeletal material of known age and sex, and eventually contained an eighth of all the anthropoid skeletal material available for study anywhere. The Brush Foundation, the Charles Bingham Bolton fund, and other contributions provided the money for the most comprehensive investigations. Time was multiplied by extending unreasonably his own working day, and by gathering around him a great company of anatomists, doctors, dentists, comparative anatomists, anthropologists,

radiologists, and the like. Todd learned to find in the X-ray film not merely an estimate of the present state of growth and development but also a record of the past in the shape and markings of the bones, the signs of acceleration and retardation together with the evidence of the shifting of growth from one part to another, and the perfection or imperfection of the rectifications consequent upon earlier deprivations. For each stage in development he wished to set up a calendar, an index of maturation as he called it, which would represent the normal achievement of the body. For this purpose he and his colleagues studied innumerable closely graded series of osseous structures in beasts, apes, and men—the age-changes of the bony surfaces of the human symphysis pubis, the growth of the facial skeleton in thyroidectomised sheep, the increase in size of the skull of the hyena, and so on.

More recently he set out to establish an index of maturation based on the repeated examination of hundreds of boys and girls. The hands, wrists, and the extremities of the bones of the forearm were selected as the most convenient and useful for the purpose. In order that all the films might be truly comparable, each one was taken under standard conditions, and in one corner of the film was included the special density scale reading. In addition to the film a record was kept of the results of clinical examination, the scholastic progress, the economic level of the home, and the behaviour of the child. Todd has related how the creation of this skeletal index of human growth entailed the repeated study of a quarter of a million films and interviews with more than four thousand people, in addition to the work of recording, classifying, and collating the study of the films with the other findings. Todd's "Atlas of Skeletal Maturation," in which his results are set out, is probably the most careful and detailed record of the rate of growth and development under optimum conditions yet compiled.

Dr. CHARLES EDWARD ALEXANDER MACLEOD, who died at his home in Kensington on Jan. 9, was the eldest son of Colonel Alexander MacLeod, I.M.S., and grandson of John MacLeod, surgeon-general of Madras. His great-grandfather, one of the MacLeods of Skye, is said to have helped to row the Young Pretender to safety. Dr. MacLeod was educated at Shrewsbury and the Westminster Hospital and qualified in 1891. After holding house appointments at the Westminster Hospital and elsewhere, he took his F.R.C.S. in 1895. Soon afterwards he started in general practice in Kensington and was actively engaged there until six weeks before his death. His two eldest sons are carrying on the long medical tradition of the family.

LETTERS TO THE EDITOR

A NEW REMEDY FOR EPILEPSY

SIR,—In view of the correspondence about the new anti-convulsant drug, sodium diphenyl-hydantoinate (Dilantin in America, Epanutin in Great Britain), introduced by Merritt and Putnam for the treatment of epilepsy, it may be helpful to indicate my own short experience of the drug. Messrs. Parke Davis kindly provided me with sufficient supplies for the treatment of a series of patients at the Maghull Epileptic Homes, to which I am consulting physician, and where I have the coöperation of the two local medical officers, Drs. Nesbitt and Burrows. I started cautiously, rather afraid of possible toxic reactions and still more scared after reading Dr. Schlesinger's letter in your issue of Nov. 5. I selected patients who had been in the Homes for some years; it must be remembered that during the whole of this time they had been "soaked" in the usual anti-epileptic drugs such as bromides, borax, and Luminal.

CASE 1.—For a year previous to treatment by epanutin he had been on full doses of bromide and borax, with luminal gr. 1 at night. During that time he had 77 minor and 73 major attacks. The bromide, borax, and luminal were gradually discontinued until he was taking a capsule of epanutin t.d.s. only. He had no fits (save for a minor one before he was fully under the new treatment), until the dose of epanutin was reduced to two capsules a day because of an albuminuria which on investigation was found to be due to a *Bacillus coli* urinary infection. On the reduced dosage he had 3 major fits in November and 4 in early December, but with the disappearance of the urinary infection the dose was increased to three capsules a day and since then he has had no more fits. Thus over a period of four months he has had 1 minor and 7 major attacks, the major fits occurring only when he was on a reduced dosage. In the corresponding months of the previous year he had had 15 minor and 14 major attacks.

CASE 2.—During the previous year, when he was having sod. bromide gr. 10 and borax gr. 10 t.d.s., he had 14 minor and 65 major attacks. In the four months of treatment with epanutin he has had no minor and 4 major attacks. There have been no fits since Dec. 6, when the dose was increased to four capsules a day. He was restored to three capsules a day at the beginning of the year. The figures for the corresponding months of the previous year are 2 minor and 24 major attacks.

CASE 3.—The previous year saw 26 minor and 190 major attacks, although he was having bromide, borax, and belladonna, and luminal gr. 1 morning and night. In September and October he had a large number of very severe major fits—32 in September and 34 in October. In the two months of epanutin treatment (three capsules a day) he has had no minor and 10 major attacks. The figures for the corresponding months of the previous year were 7 minor and 21 major. It will be interesting to see if an increase to four capsules a day is effective in obtaining more clear-cut control.

CASE 4.—In the previous year he had 59 minor and 224 major attacks. Since having two months' treatment with epanutin (three capsules a day) he has had 1 minor and 5 major attacks. The figures for the corresponding months of the previous year were 6 minor and 27 major attacks. For the six months previous to being put on epanutin he was having an average of 21 major attacks a month, in spite of being on bromide, borax, and luminal.

CASE 5.—In the previous year there were 5 minor and 126 major attacks. Epanutin (three capsules a day) has now been given for two months, and to date he has had only 1 major attack.

I have not selected for report any cases which have been under the new treatment for less than two months. One patient has had epanutin (three capsules a day) for a month without any apparent effect on the number of fits. Two patients with mental deterioration were given the drug for a week or two, and it was then discontinued as being perhaps hardly a fair test. To only one patient have we given more than three capsules in the 24 hours. There have been no toxic manifestations as yet among our

patients, save for "giddiness" in one of the above-mentioned patients with mental deterioration.

It is clear that in most of the patients we have treated so far epanutin is far more effective in reducing the number of fits than bromide, borax, and luminal. But even if it did not alter the usual incidence of fits, it might well be the medicament of choice, for the patient who has been "doped" with bromide and luminal for years is so often mentally dull, with a spotty face and a dirty tongue—toxic manifestations which are unpleasant both for the patient and those about him. Our patients on epanutin are usually brighter and feel better, with clean tongues; and the discontinuance of bromides allows them to recover from the acneiform drug-rash which is so common. Even the patient mentioned earlier, whose fits have not been appreciably modified by a month's treatment with epanutin, is described now as "looking much healthier, and a different boy mentally." The most striking illustration of this is case 5. He was a very dull, negative type of patient, depressed, and gradually deteriorating mentally year by year. A few weeks after he had been put on the new treatment he was found gaily sliding down the banisters, a thing so unbelievable in this young man that it almost became a nine days' wonder throughout the colony.

Obviously much trial and observation will be needed before epanutin can establish itself as the drug of choice for most cases of epilepsy; and those who use it should bear in mind your recent annotation (*Lancet*, Oct. 22, 1938, p. 956). Especially important are the questions whether it will lose its efficacy when used over a long period and whether it will produce late toxic manifestations. Nevertheless, the drug seems to hold out great promise, and enough is already known about it to justify its trial, naturally with the careful supervision proper to a remedy for which a final "body of knowledge" has not yet been accumulated. In addition to routine clinical watchfulness the doctor using this drug would be wise to test his patient's urine frequently for albumin and urobilin.

I am, Sir, yours faithfully,

Liverpool, Jan. 14. ROBERT COOPE.

WHITHER THE ALMONER?

SIR,—The writer of the annotation with this title, in your issue of Jan. 7, mentions my name and fathers upon the Westminster Hospital intentions of which it is innocent. Our almoners do not "claim medical knowledge" nor is it proposed to delegate to them the work of the medical staff. Far from adopting any plan that will "weaken contact between hospital-staff and practitioner," our determination is to ensure the closest and most intimate association. Your representative at a public dinner no doubt heard, in brief outline, something of our proposals. Had he made inquiry he would not have viewed the matter obliquely enough to provoke such an anonymous letter as followed in your last issue signed "House Governor."

Before planning the new building of the Westminster Hospital an endeavour was made to view our own organisations, not as they ought theoretically to function but as in fact they worked or failed to work, and to adapt the new structure to function as perfectly as possible. Experience with follow-up work showed us that in our own and in some other institutions the greatest efficiency was found in the almoner's department. The clerks for the resident registrars, in writing to doctors, constantly made use of records in the almoner's department, or duplicated the information; the clerk in the administration offices, who dealt under the direction of the medical staff with admissions, had further files and indices covering much of the same ground.

What we have done in the new building is to place three communicating rooms on each floor, all in the same vertical plane, in direct contact by service lift and vacuum tube with one another and with the head office of the almoner and the records department. In one room is the almoner, in the next her clerk and stenographers, and in the next the records clerk. All these women, on each floor, are under the supervision of the floor almoner, who is of course under the chief almoner and in the closest touch with her. We happen to call this whole organisation "the Almoners' Department," and a good case can be made for so doing; but, if the choice is a cause of stumbling to the innocent, let the Editor of the *Lancet* solve the problem in nomenclature which proved too much for the Institute of Hospital Almoners.

In this department there are several services all using the same records of person, place, and connexions. The almoner will function as the institute's brochure sets forth. The stenographers will be available for the medical staff to write their reports to the practitioners; the records staff will be handy to ensure the issue and return of notes; the telephonist will be available for communication to or from all practitioners to the units on each floor. This is not the place to elaborate further, but I hope enough has been said to avoid further misconception of our intentions. The whole aim of our plan is to draw closer the connexion between the general practitioner and the hospital, and to facilitate both his work and ours in the best interest of his patients.

I am, Sir, yours faithfully,

Brook Street, W.1, Jan. 16. E. ROCK CARLING.

SIR,—I am seldom moved to expostulate about a letter in the *Lancet* and still less seldom write about it. But the communication in your last issue from "House Governor" attacking, I presume, the work of hospital almoners stirs me to answer. I cannot understand its full implications, couched in the most mysterious obscurity of phrase and meaning. But I want to say that in my hospital and my department the almoners' work is of great value and often of prime importance in our work. I do not think "House Governor" should be anonymous nor without address, however obscure his letter may be. Let the criticism be less hidden.

I am, Sir, yours faithfully,

R. D. LAWRENCE.

Diabetic Department, King's College Hospital, S.E.5, Jan. 16.

*** We published House Governor's letter because we think it right to ventilate the opinions of those well qualified to form them. The disadvantages of anonymity may be outweighed by the advantages of free discussion.—ED. L.

OILY SUSPENSIONS OF SULPHANILAMIDE COMPOUNDS

SIR,—Dr. Long rightly interprets the remarks made in my Bradshaw lecture (*Lancet*, Nov. 12) as implying that "in certain instances" the pyridine compound, M. & B. 693, may be given parenterally in oily suspension. Thereby he at least gives me credit for not advocating the procedure as a routine. Whatever may have been the total number of cases

of dangerous complications from sulphanilamide therapy in Dr. Long's presumably large experience, one cannot assess their significance unless information is also given as to the number of treated cases not manifesting these complications and also the amount of drug administered. When making use of a powerful remedy for the treatment of a dangerous disease such as pneumonia, one must consider not only the risk which the patient runs from the remedy but also the risk from the disease itself. "In certain instances," indeed in many, the last-named risk is the greater.

I am, Sir, yours faithfully,

L. E. H. WHITBY.

Bland-Sutton Institute of Pathology, Middlesex Hospital, London, W.1, Jan. 16.

PROPHYLAXIS WITH SULPHANILAMIDE

SIR,—I have read with interest Dr. E. D. Hoare's stimulating account of his experimental work with sulphanilamide and T.693 used prophylactically against streptococcal infections (*Lancet*, Jan. 14). He suggests the use of these drugs as a protective measure in maternity cases where there is believed to be special risk of infection with hæmolytic streptococci. These drugs have been giving such remarkable results that his suggestion is certain to be followed by many workers, and rightly so, but attention must be given to possible toxic effects upon the fœtus; these are, perhaps, chiefly to be expected and looked for in the hæmatopoietic system of the newborn infant. This system is known to be a delicate one, subject to pathological states, such as erythroblastosis fœtalis, which illustrate its extremely labile nature.

Seeing that the sulphanilamides have caused hæmolytic anæmia, agranulocytosis and aplastic anæmia in adults, it is important that any clinical worker who makes use of these compounds to prevent puerperal infection should, from the beginning of his observations, take due note of the effect on the newborn infant. At present T.693, which has relatively little destructive action on the blood, is probably the safest sulphonamide for this purpose, but even it is not without danger to the leucopoietic system, especially when the total amount of the drug administered is large.

I am, Sir, yours faithfully,

REGINALD LIGHTWOOD.

Brook Street, Grosvenor Square, W.1, Jan. 16.

FRACTURE OF THE PATELLA

SIR,—I was much interested in the clinical note by Dr. Mehriz in your issue of Jan. 14 describing his experiences in performing the operation of removal of the patella, and especially in the radiogram of his case, showing a shadow at the site of the sutured quadriceps. I do not think Dr. Mehriz is correct when he interprets this shadow as due to the regeneration of bone. The patella is a sesamoid bone, developing from cartilage, and does not have a periosteal covering. A more likely explanation of this shadow appears to be calcification round his sutured material, or heterogeneous calcification as the result of hæmorrhage.

Since writing my original article I now advocate the use of a fascial transplant to repair the gap, should there be difficulty in bringing together the quadriceps expansion. Even when the quadriceps expansion is brought together under tension it appears to join firmly. I had an example of this last year in a case in which three months after the excision of the patella for a comminuted fracture the patient slipped from the pavement with resulting weakness of the knee. The previous operation site was explored by Mr. Todd, when it was found that my opening round the quadriceps in front of the knee had firmly joined, but that the vastus internus muscle belly had torn away from its insertion into the vastus expansion.

I still think that the operation of removal of the patella should be reserved for cases of comminuted fracture, cases which have been wired in bad position, or cases of osteo-arthritis with much lipping.

I am, Sir, yours faithfully,

Devonshire Place, W.1, Jan. 17. G. O. TIPPETT.

LORD HORDER AND THE *DAILY MAIL*

SIR,—Your attention may have been drawn to an article which appeared in the *Daily Mail* of Thursday last referring to Lord Horder and stating that he had been assisting behind the scenes in the filming of Dr. Cronin's book "The Citadel." This statement Lord Horder informed us was unfounded. In consequence a paragraph of correction was published in today's *Daily Mail*, in which we expressed our apologies to Lord Horder for the mistake that had arisen. I send you a marked copy of today's *Daily Mail*, as you may think it desirable to refer to the matter.

I am, Sir, yours faithfully,

STANLEY BELL,
Managing Director.

Associated Newspapers Limited, Northcliffe House, E.C.4, Jan. 16.

*** The paragraph runs as follows:—

Lord Horder and "The Citadel"

"Lord Horder informs us that the references to him in Hamish Fraser's article in last Thursday's *Daily Mail* dealing with the production of the film of Dr. Cronin's 'The Citadel' are entirely unfounded.

'I had nothing whatever to do with the film in an advisory or any other capacity,' says Lord Horder.

'I have never even read the book nor seen the film at any stage in its preparation or since, and am unable to understand how the article came to be written.'

"We desire to express our sincere apologies to Lord Horder for the unfortunate error which was made."

". . . We are clinicians, not stamp collectors. And yet we are continuously assailed on every hand by a public, medical and lay, which demands a simple nominal solution to be neatly pigeon-holed or filed. Doctors and dressers say: 'Well, what is the answer?' Patients and their relations say: 'We insist on getting to the bottom of this; what is the Cause?' Poor ignorant souls; they are very trying, and often infuriating. What can their conception of a *primum mobile* be? I only wish we could give them the answer they require—it seems to be far more important to them than treatment, even successful treatment; but most of us have a streak of intellectual honesty (or professional snobbishness) which prevents our inventing an impressive word or phrase to meet the occasion . . . someone must hold the fort of truth in a world that is hysterical, confused and seeking after miracles. It is even better to say: 'I do not know.' You can add: 'Although I am generally supposed to be the greatest living authority on this subject!' That is at least an honest and harmless lie, and you may get away with it."—FRANK COOK. *Guy's Hosp. Gaz.* 1938, **52**, 401.

MEDICAL NEWS

Royal College of Surgeons of England

A meeting of the council was held on Jan. 12 with Mr. Hugh Lett, the president, in the chair. It was reported that at the recent primary examination for the fellowship held in Lahore 6 out of 31 candidates were approved, and at the examination held in London 83 out of 236 candidates were approved. The Hallett prize was awarded to Mr. A. McK. Large, of the University of Toronto.

Prof. R. E. Kelly was reappointed as the representative of the college on the court of the University of Liverpool, and Dr. Gilbert Orme was appointed representative on the council of the Queen's Institute of District Nursing. Prof. Graham Simpson was appointed as the Bradshaw lecturer for this year.

Diplomas of fellowship were granted to J. K. Cunninghame of Otago and Mohamed Fatin of Cairo, and a diploma of membership to P. D. Swinstead of St. Bartholomew's Hospital.

The following diplomas were granted, jointly with the Royal College of Physicians of London :—

D.P.M.—J. T. D. Clark, H. N. Davy, Nagendranath De, A. K. Deb, P. F. Fletcher, A. R. Garner, Robert Gibson, Y. H. Guienena, Daisy G. Iliff, Norman Langdon-Down, J. MacW. MacGregor, R. D. Newton, Chelliah Ponnambalam, J. J. Ryan, and W. T. H. Wales.

D.L.O.—K. H. Bazirgan, A. H. R. Champion, H. G. Earnshaw, Osman Fawzy, J. R. Hutcheon, D. T. Martin, N. M. Mody, G. A. Moulden, T. R. Pahwa, H. V. Suryanarayan Rao.

The following hospitals were recognised for the six months' surgical practice required of candidates for the final fellowship examination : Victoria Hospital, Blackpool (surgical unit No. 1); Royal Infirmary, Lancaster (first and second house surgeons); and Prince of Wales's Hospital (Devonport section), Plymouth (senior house surgeon to July 31, 1942).

University of Glasgow

The address on the surgery of the eye in Hungary which Prof. Emile de Grósz was to have delivered in the department of ophthalmology of the university on Jan. 18 had to be postponed. He will give it instead on Tuesday, April 25, at 8.15 P.M.

Harveian Society of London

The annual general meeting of this society was held on Jan. 13 when Dr. A. D. Morris, the new president, was inducted. The following were appointed to serve on the council of the society for the coming year :—

Dr. Morris (president); Dr. F. S. Cooksey, Mr. M. F. Nicholls, Dr. G. de Bec Turtle, and Mr. E. G. Muir (vice-presidents); Mr. Cecil P. G. Wakeley (treasurer); Dr. H. L. Glyn Hughes and Mr. W. Eldon Tucker (secretaries); Dr. N. Gray Hill, Dr. Gilbert Orme, Dr. H. Moore, Dr. E. Tallent Nuthall, Mr. M. J. H. Peel, Mr. A. E. Sawday, Dr. James Tait, Dr. John Taylor, Mr. A. Simpson-Smith, Sir Alfred Webb-Johnson, Mr. John Hunter, and Mr. Wallis Kendall (members of council).

Refugee Nurses

At a meeting of the Gateshead public assistance committee on Jan. 9 a resolution was carried refusing to accept two refugee nurses as probationers at Gateshead Institution for each of the next four years. A circular had been sent to Gateshead, among other local authorities, by the nursing subcommittee of the Coördinating Committee for Refugees, asking for help in placing refugees, and the resolution was passed in reply to this circular.

Child Guidance Conference

The fourth biennial Child Guidance Inter-clinic Conference will be held on Jan. 27 and 28, at B.M.A. House, Tavistock Square, London, W.C.1. Subjects for discussion will include : treatment of parents, juvenile delinquency, personality deviations and diagnosis of psychoses, the scope of the educational psychologist working in the schools, and substitute homes. At the session for administrative representatives the findings of the Feversham report on the voluntary mental health services will be considered as they affect the policy and administration of the child guidance movement. Further information may be had from the secretary of the Child Guidance Council, Woburn House, Upper Woburn Place, W.C.1.

King's College Hospital, London

The next meeting of the Listerian Society will be held at this hospital on Jan. 25 at 8.30 P.M., when Dr. Robert Hutchison, the president of the Royal College of Physicians, will speak on medical literature.

Ophthalmic Exhibition

Today, Friday, Jan. 20, at noon, Sir Francis Fremantle will open the National Eye Service Exhibition at the Charing Cross underground station booking hall. The exhibition has been arranged by the National Ophthalmic Treatment Board, 148, Great Portland Street, London, W.1, from whom further information may be had.

International Cancer Congress

Membership blanks for the third International Cancer Congress, which is being held in Atlantic City in September, may now be had from the offices of the British Empire Cancer Campaign, 11, Grosvenor Crescent, London, S.W.1. Further information about the congress may be obtained from Mr. Cecil Rowntree, 17, Harley House, N.W.1.

Society of Radiotherapists of Great Britain and Ireland

A meeting of this society will be held today, Friday, Jan. 20, at 5 P.M., at 11, Chandos Street, London, W.1, when Prof. R. S. Pilcher, Mr. G. F. Stebbing, Dr. Dobbie, Mr. R. F. Phillips, and Mr. T. A. Green will open a discussion on carcinoma of the larynx, lesions in the arytenoids, aryepiglottic folds, and pyriform fossa.

Order of the Nile

Dr. A. F. Bernard Shaw, professor of pathology in the University of Durham, has been given permission to wear the insignia of commander of the Order of the Nile, bestowed on him by the King of Egypt for his services as professor of pathology in the Farouk University at Cairo.

Award of Pavlov Prize

It is announced by the Academy of Sciences of the U.S.S.R. that the I. P. Pavlov prize for 1938 has been awarded to Honoured Worker in Science I. S. Beritashvili, professor of physiology at Tbilisi University. Previous holders of the prize have been Academician L. A. Orbeli and Prof. A. D. Speransky. The present recipient, Prof. Beritashvili, is the author of numerous works on the physiology of the central nervous system, published in Russian and foreign languages.

Cod-liver Oil for Spain

The first Humber food-ship, the *Ragnhild*, taking supplies from the people of Yorkshire to refugees in Spain, included in her cargo 30 tons (about 7500 gal.) of cod-liver oil, representing a fifth of the total value of the cargo. The cod-liver oil was supplied at cost price by the Hull trawler-owners, who state that they are prepared to supply almost unlimited quantities on the same terms for relief work or refugees in any country.

Hospital Amalgamation at Sheffield

The Act of Parliament amalgamating the Royal Infirmary, Sheffield, and the Sheffield Royal Hospital came into operation on Jan. 1, and the new governing body at its first meeting on Jan. 3 elected Sir Ronald Matthews its first chairman, Mr. Fred M. Osborn, deputy chairman, and Mr. W. H. Booth, secretary. Two boards were also appointed, one to manage each institution, and a finance committee. The amalgamated hospitals will be known as the Royal Sheffield Infirmary and Hospital.

An appeal for £1,000,000 was launched in July on behalf of the Sheffield voluntary hospitals. The fund will be used to finance extensions at the Jessop Hospital for Women and at the Children's Hospital, and also to purchase a site near the university and to build there a new general hospital of some 800 beds. The whole group, together with the medical school of the university, will form a hospital centre which will serve not only the city of Sheffield but also the large area surrounding it.

Medical Diary

Jan. 23 to Jan. 28

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1.
MONDAY.
Odontology. 8 P.M., Dr. E. Wilfred Fish: Calcified Tissue of Repair. Prof. H. Humphreys: Teeth from a Case of Hypoparathyroidism.
TUESDAY.
Medicine. 8.30 P.M., Prof. J. A. Ryle, Dr. J. H. Sheldon, and Dr. A. W. Spence: Anorexia Nervosa.
THURSDAY.
Urology. 8.30 P.M., Mr. Terence Millin: The Surgical Treatment of Urinary Incontinence. Mr. Victor Bonney will also speak.
FRIDAY
Disease in Children. 5 P.M. (cases at 4.15 P.M.), Mr. David Levi: (1) Osseous Dystrophy. Dr. F. Parkes Weber: (2) Dwarfism of Uncertain Causation. Dr. R. S. Illingworth (for Dr. Donald Paterson): (3) Congenital Cystic Lung.
Epidemiology and State Medicine. 8.15 P.M., Dr. R. E. Smith: Epidemiological Problems of Poliomyelitis in Schools. Dr. G. O. Barber will also speak.

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1.
MONDAY.—8.30 P.M., Sir Henry Gauvain and Dr. C. P. Symonds: Poliomyelitis, including Artificial Aids to Respiration.

ASSOCIATION OF INDUSTRIAL MEDICAL OFFICERS.
FRIDAY.—6 P.M. (London School of Hygiene, Keppel Street, W.C.1), Mr. Frederick Ridley and Dr. F. H. C. Beards: The Eyes of the Industrial Worker. Mr. J. Minton will show a film on the Prevention of Industrial Eye Injuries.
SATURDAY.—10 A.M., visit to the Albert Dock Hospital at Custom's House, E.16, Mr. H. E. Griffiths: demonstration.

KENSINGTON MEDICAL SOCIETY.
WEDNESDAY.—8.30 P.M. (St. Mary Abbots Hospital, Marloes Road, W.8), Dame Louise McIlroy and Prof. James Young: Diet in Pregnancy.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY, Stepney Green, E.1.
THURSDAY.—3.45 P.M., Sir Maurice Cassidy: The Consultant Looks upon the Practitioner. Dr. J. Snowman: The Practitioner Looks upon the Consultant.

MEDICO-LEGAL SOCIETY
THURSDAY.—8.30 P.M. (26, Portland Place, W.1), Dr. Kenneth McFadyean: The Death of Edwin Bartlett.

BRITISH PSYCHOLOGICAL SOCIETY.
Medical Section.
WEDNESDAY.—8.30 P.M. (1, Wimpole Street, W.1), Dr. Denis Carroll: The Psychotherapy of the Psychoses. (Presidential address.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2.
FRIDAY.—5 P.M., Mr. E. W. Riches: Hydronephrosis—the Results of Conservative Treatment. (Hunterian lecture.)

ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS, 58, Queen Anne Street, W.1.
FRIDAY.—5.30 P.M., Mr. Alan Brews: Hydatidiform Mole and Chorion-epithelioma. (Blair-Bell lecture.)

TAVISTOCK CLINIC, Malet Place, W.C.1.
MONDAY.—4.30 P.M., Dr. H. V. Dicks: Phobias.
THURSDAY.—2.30 P.M., Dr. G. W. B. James: Physical and Psychotic Syndromes. 3.30 P.M., Dr. J. R. Rees: Emergency Treatment of Neurotic States. 4.30 P.M., Dr. T. W. Mitchell: Pregenital Phases.

INSTITUTE OF PSYCHO-ANALYSIS, 96, Gloucester Place, W.1.
TUESDAY.—8.30 P.M., Dr. Denis Carroll: Psychoses.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12.
MONDAY.—4.30 P.M., Prof. J. Henry Dible: Nephritis.
TUESDAY.—4.30 P.M., Dr. Izod Bennett: Nephritis.
WEDNESDAY.—NOON, clinical and pathological conference (medical). 2 P.M., Mr. E. J. King, Ph.D.: Jaundice and Tests of Liver Function. 3 P.M., clinical and pathological conference (surgical). 4.30 P.M., Prof. Shaw Dunn: Nephritis, and Renal Changes in Hypertension.
THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration. 3.30 P.M., Mr. J. M. Wyatt: Obstetric Emergencies.
FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology). 2.30 P.M., Mr. R. Watson Jones: Fracture Dislocations and Other Injuries of the Joints.
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

HOSPITAL FOR SICK CHILDREN, Great Ormond Street, W.C.1.
THURSDAY.—2 P.M., Dr. Donald Paterson: So-called Acidosis Attacks. 3 P.M., Mr. A. Simpson-Smith: Intussusception and Volvulus.
Outpatient clinics daily at 10 A.M., ward visits at 2 P.M.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn Road, W.C.1.
FRIDAY.—4 P.M., Mr. J. D. McLaggan: Acute Mastoiditis.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL, N.W.3.
WEDNESDAY.—4 P.M., Mr. Cameron MacLeod: Common Diseases of Thyroid Gland.

MAIDA VALE HOSPITAL FOR NERVOUS DISEASES, W.9.
THURSDAY.—3 P.M., Dr. Russell Brain: clinical demonstration.

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle Street, W.C.2.
TUESDAY.—5 P.M., Dr. L. Forman: Sycosis.
THURSDAY.—5 P.M., Dr. G. Duckworth: Erythemato-squamous Eruptions. (Chesterfield lectures.)

ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh Road, S.W.1.
FRIDAY.—3.30 P.M., Mr. H. J. Taylor, Ph.D.: The Physical Basis of Treatment in the Rheumatic Diseases.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W.1.
MONDAY to SATURDAY.—BROMPTON HOSPITAL, S.W.3, all-day course in chest diseases.—ST. JOHN'S HOSPITAL, 5, Lisle Street, W.C.2, afternoon course in dermatology. (Open to non-members.)—ST. PETER'S HOSPITAL, Henrietta Street, W.C.2, all-day course in urology.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY.—4.15 P.M. (Western Infirmary), Mr. M. Logan Taylor: Gall-bladder Disease and Treatment.

Vacancies

For further information refer to the advertisement columns

Army Dental Corps.—Commissions.
Barbados General Hosp.—H.S. and anæsthetist, £450.
Barrow-in-Furness County Borough.—Asst. M.O.H. and asst. school M.O., £500.
Belgrave Hosp. for Children, Clapham Road, S.W.9.—Asst. physician.
Benenden, Kent, National Sanatorium.—H.P., at rate of £150.
Birmingham New Centre Hosp.—Asst. to radiological dept., £400.
Birmingham University.—Third lecturer in bacteriology and asst. bacteriologist in public health laboratory, £350.
Brighton, Royal Alexandra Hosp. for Sick Children, Dyke Road.—Hon. physician. Also H.P., £150.
Burton-on-Trent General Infirmary.—Cas. O. and H.P., £150.
Central London Ophthalmic Hosp., Judd Street, W.C.1.—Hon. asst. physician.
Chorley and District Hosp.—H.S., at rate of £150.
Cheshire Education Committee.—Asst. school M.O., £500.
Derby County.—Deputy county M.O.H., £840.
Dorking County Hosp.—Res. asst. M.O., at rate of £250.
Dreadnought Hosp., Greenwich, S.E.10.—Receiving-room officer, £150. H.S. at rate of £110. Also hon. dermatologist.
Durham County Council.—Asst. school M.O., £500.
Edinburgh, Eastern and Northern General Hosps.—Res. H.P.'s, each at rate of £100.
Edinburgh, Margaret Rose Hosp. for Crippled Children, Fairmilehead.—Res. surg. O., £100.
Essex County Council and Corporation of Chingford.—Asst. county M.O. and M.O.H., £400.
Evelina Hosp. for Sick Children, Southwark, S.E.1.—H.P., at rate of £120.
Exeter City and County.—Deputy M.O.H. and asst. tuber. officer, £550.
Home Office, Air-Raid Precautions Dept., Whitehall, S.W.—Medical instructor, £550.
Hosp. for Sick Children, Great Ormond Street, W.C.1.—Clin. pathologist, £600.
Lancaster County Mental Hosp.—Asst. M.O., £550.
Leamington Spa, Warneford General Hosp.—Res. cas. O. and H.S., at rate of £150.
Liverpool, Alder Hey Children's Hosp.—Res. asst. M.O.'s, each at rate of £200.
Liverpool City.—Res. asst. M.O.'s for special hospitals, each £200.
Liverpool Heart Hosp.—H.P., at rate of £100.
Liverpool Royal Children's Hosp., Myrtle Street.—Res. cas. O., at rate of £250.
London County Council.—Temporary part-time rheumatism registrar, £350. Asst. M.O.'s Class I, each £350. Also asst. M.O.'s Class II, each £250.
Maidstone, West Kent General Hosp.—H.S., £175.
Manchester, Christie Hosp. and Holt Radium Institute.—Hon. physician.
Manchester Ancoats Hosp.—Radiological officer, £400.
Manchester Royal Children's Hosp., Pendlebury.—Res. surg. O., at rate of £150.
Manchester Royal Eye Hosp.—Jun. H.S., £120.
Margate and District General Hosp.—Res. M.O., £150.
Middlesbrough Education Committee.—Asst. school M.O., £500.
Middlesbrough, St. Luke's Mental Hosp., Grove Hill.—Asst. M.O. and deputy med. supt., £550.
Middlesex County Council.—Physician (Grade II), £650. Also cas. M.O., at rate of £350.
Miller General Hosp., Greenwich Road, S.E.10.—Asst. radiologist, £100.
National Hosp., Queen Square, W.C.1.—H.S., £100.
Newcastle-upon-Tyne Hosp. for Children.—Two H.S.'s, each at rate of £100.
New Zealand, Otago University Medical School.—Professor of medicine, £2000. Also lecturer in biochemistry, £650.
Portsmouth Royal Hosp.—Cas. O., at rate of £130.
Preston, Biddulph Grange Orthopædic Hosp.—Jun. H.S., at rate of £200.

*Princess Elizabeth of York Hosp. for Children, Shadwell, E.*1.—Hon. radiologist for X ray and electro-therapeutical dept.
*Queen Mary's Hosp. for the East End, Stratford, E.*15.—Hon. asst. aural surgeon.
*Queen's Hosp. for Children, Hackney Road, E.*2.—H.S., and Cas. O., each at rate of £100.
*Radium Institute, Riding House Street, W.*1.—Res. M.O., at rate of £250.
Richmond, Surrey Royal Hosp.—Jun. H.S., £100.
Rotherham Municipal General Hosp.—Asst. res. M.O., £350.
Royal Air Force.—Commissions.
*Royal Free Hosp., Gray's Inn Road, W.C.*1.—Asst. M.O. in V.D. dept., £300.
*Royal London Ophthalmic Hosp., City Road, E.C.*1.—Three out-patient officers, each £100.
***Royal Naval Medical Service.*—M.O.'s.**
Slough Borough, &c.—Deputy M.O. and deputy med. supt., £500.
Southend-on-Sea General Hosp.—First H.S., at rate of £100.
St. Albans, Shenley Hosp. for Nervous and Mental Illness.—Fifth asst. M.O., £485.
*St. George's Hosp., S.W.*1.—Res. asst. physician, £250.
Saint Mary's Hosp. for Women and Children, Plaistow, E.13.—Res. surg. O. and res. H.P., at rate of £155 and £150 respectively.
*St. Pancras Borough Council Public Health Dept., Euston Road, N.W.*1.—M.O. for gynæcological clinic, 2 guineas per consultation.
Stirling District Mental Hosp., Larbert.—Third asst. M.O., £300. Also fourth asst. M.O., £250.
*University College Hosp., Gower Street, W.C.*1.—Registrar to Royal Ear Hospital, £250.
Walsall General Hosp.—Res. surg. O.
Ware Park Sanatorium.—Asst. M.O., £300.
*West End Hosp. for Nervous Diseases, Gloucester Gate, N.W.*1.—Two res. H.P.'s, each at rate of £125.
*West London Hosp., Hammersmith Road, W.*6.—Res. surg. reg. and tutor, £225.
*West London Hosp. Medical School, W.*6.—Lecturer in forensic medicine.
West Riding, Keighley and District Victoria Hosp.—Second res. M.O., at rate of £120.
Wolverhampton Royal Hospital.—H.S. for fracture and orthopædic dept., at rate of £100.
*Woolwich and District War Memorial Hosp., Shooters Hill, S.E.*18. Hon. anæsthetist.
York County Hosp.—H.P., £150.

The Chief Inspector of Factories announces vacancies for Examining Factory Surgeons at Burton-on-Trent (Stafford), Addingham (Yorks, W.R.), Buxton (Derby), New Southgate (Middlesex), and Maryport (Cumberland).

Births, Marriages, and Deaths

BIRTHS

BANHAM.—On Jan. 12, the wife of Mr. Roy Banham, F.R.C.S., of Northampton—a son.
BOULTBEE.—On Jan. 15, the wife of Major J. H. Boulbree, I.M.S., Dublin—a son.
CAMPBELL.—On Jan. 12, at Rugby, the wife of Dr. George Campbell—a son.
FRIZELLE.—On Jan. 14, the wife of Dr. Gordon M. Frizelle, of Leicester—a son.
GIMBLETT.—On Jan. 12, at Welbeck Street, W.1., the wife of Mr. Charles Leonard Gimblett, F.R.C.S.—a son.
JOHNSON.—On Jan. 14, at the London Clinic, the wife of Dr. Bernard R. M. Johnson—a daughter.
KELLOCK.—On Jan. 11, at Aberdeen, the wife of Dr. A. M. Kellock—a daughter.
LIGHT.—On Jan. 9, at St. Thomas's Hospital, the wife of Dr. L. H. B. Light—a son.
NICHOLSON.—On Jan. 3, at Hong-kong, the wife of Surg.-Comdr. C. B. Nicholson, R.N.—a son.
SHACKLETON BAILEY.—On Jan. 15, at Norwich, the wife of Dr. Shackleton Bailey—a daughter.
SMITH.—On Jan. 15, at Newcastle-on-Tyne, the wife of Dr. David Smith—a son.
SUTTON.—On Jan. 10, at the London Clinic, the wife of Dr. R. J. C. Sutton—a son.
WALKER.—On Jan. 12, 1939, at Rainton Gate, co. Durham, to Dr. and Mrs. G. F. Walker—a son.

MARRIAGES

PARKES—WOOLLEY.—On Jan. 10, at St. Werburgh's Church, Bristol, P. W. J. Parkes, M.R.C.S., to Margaret Woolley.

DEATHS

CORNABY.—On Jan. 11, Edgar Edward Cornaby, B.Chir. Camb., M.R.C.S., of Vaughan Avenue, W.6.
FALKINER.—On Jan. 7, at St. Martin's, Guernsey, John McIntire Falkiner, F.R.C.S.I., Barrister-at-Law, late of Assam and Ceylon, aged 70.
GRANGER.—On Jan. 11, at Kingston Blount, Oxon, Edgar Bridden Granger, M.R.C.S., aged 85.
LAUGHTON.—On Jan. 15, 1939, suddenly, at Stanmore, Middlesex, James Millar Laughton, M.B., C.M., aged 72.
LONG.—On Jan. 15, at Norwich, Sydney Herbert Long, M.D. Camb., aged 68.
PATERSON.—On Jan. 10, at Ascot, Alexander Gordon Paterson, M.D. Edin., aged 79.
PRESTON.—On Jan. 14, at St. Annes-on-Sea, J. M. S. Preston, M.B., C.M. Edin.

N.B.—A fee of 1s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths

Appointments

CHRISTIE, ALBERT, M.B. Aberd., visiting anæsthetist to the Victoria Infirmary, Glasgow.
COCHRANE, GEORGE, M.B. Glasg., D.P.H., medical officer of health for the borough of Buxton and rural district of Chapel-en-le-Frith.
FARRIS, C. D., M.R.C.S., L.D.S., chief assistant in the dental department of St. Bartholomew's Hospital, London.
FIELD, C. ELAINE, M.D. Lond., first assistant in the children's department of University College Hospital, London.
GARREY, M. M., M.B. Glasg., second assistant resident medical officer at Woodilee Mental Hospital, Glasgow.
JENKINS, T. P. N., M.B. Lond., assistant medical officer at Farnham County Hospital.
JONES, E. ELLIS, M.B. Lond., house physician to the Salisbury General Infirmary.
LORRIMAN, GERRARD, M.B. Durh., medical registrar at the Royal Victoria Infirmary, Newcastle-on-Tyne.
LYTH, CONSTANCE M. F., M.B. Manc., resident house surgeon at the Royal Manchester Children's Hospital, Pendlebury.
MACGREGOR, ALEXANDER, M.B. Camb., L.D.S., assistant dental surgeon to St. Bartholomew's Hospital, London.
OWEN, J. R., M.R.C.P., hon. assistant physician to the Hospital for Diseases of the Skin, London.
REYNOLDS, S. J., M.B. Camb., D.M.R.E., hon. clinical assistant in the X-ray and electrotherapeutic department at Charing Cross Hospital, London.
THATCHER, R. D., M.R.C.S., resident medical officer at Salisbury General Infirmary.

Examining Surgeons under the Factories Act, 1937: Dr. A. G. WILKINSON (Egham District, Surrey); Dr. J. G. CHAPPEL (Fakenham District, Norfolk); Dr. G. R. LUNN (Melton Mowbray District, Leicester).

THE SPECIAL AREAS

THE work of the Commissioner for the Special Areas is reviewed in a report lately issued by H.M. Stationery Office (Cmd. 5896, 2*s*.). There is much of note in the economic aspects of the report, as in the development of trading estates and the encouragement of new industries as a long-term policy in view of the continuously presented "serious problem of a working population in excess of the present employment capacity in the Areas." Of special interest, however, is the wide range of activity directed towards betterment of the public health.

The financial position of local authorities within the Special Areas renders it difficult for them to embark unaided on necessary measures of improvement. Generous assistance has been given in former years and arrears of development have to a large extent been met, or are in process of being met, so that the commissioner is now able to report "when these outstanding schemes have been completed it is the opinion of the Ministry of Health that, taking a general view, the health services, whether provided by local authorities or voluntary organisations, will be substantially up to the level of the services in other parts of the country." Such assistance has been continued during the year under review, and it appears that particular attention has been given to hospital facilities, allowing for assistance to 7 schemes of local authorities and 8 schemes for voluntary hospitals. Aid has also been given to the remedy of deficiencies at maternity and child welfare centres, to the provision of nursery schools, to the encouragement of district nursing, to the supply of medical comforts, to the subsidising of cheap milk schemes, to the organisation of cookery classes. The main feature of financial assistance continues to be towards the improvement of sanitary services, water-supply, sewerage and sewage disposal, and closet conversion. Grants were promised during the year towards 23 schemes for water-supply, 54 sewerage schemes, and 11 schemes for closet conversion. The total estimated cost of work of public utility for which grants were approved during the year was £1,429,211.

It is observed that the activity of the commissioner has done much to mitigate the difficulties of local authorities in providing essential services, and must prove of material benefit to the health of the inhabitants of the Special Areas.

NOTES, COMMENTS, AND ABSTRACTS

PRINCIPLES OF MEDICAL RESEARCH
THE LIMITATIONS OF HISTOLOGY

BY LORENZ S. MICHAËLIS, M.D. Berlin, L.R.C.P.E.
CLINICAL ASSISTANT IN THE ORTHOPÆDIC DEPARTMENT, ST. JOHN'S CLINIC, LONDON

IN 1926 an extensive discussion took place at a meeting of the German Pathological Society on two rare but interesting diseases of the skeleton, osteitis fibrosa and Paget's disease. This was followed by a flow of papers on this subject from nearly every country in the world, especially after, in the same year, the Viennese surgeon Mandl showed that by looking for and excising a tumour of the parathyroid glands osteitis fibrosa could at least be arrested and probably cured.

The volume of evidence that accumulated between 1926 and 1933 may be judged from the fact that in order to review this one theme in a comprehensive manner I had to read more than 2000 papers and references, 950 of which proved to contain essentials.

Among the many general and special questions to be discussed, one in particular attracted my attention. Three opposing camps had formed among the pathologists of the world on the question whether the two diseases were (1) different in everything except that both were generalised diseases of the skeleton; (2) only different stages or forms, the one more acute, the other more chronic, of an identical underlying pathological condition; (3) not comparable, because only Paget's disease was a disease sui generis, while osteitis fibrosa was not a definite disease at all but something like a variation of rickets.

The main representatives of these camps in 1930 were three continental specialists in the histology of bone—Pommer, the grand old man of Austrian pathology; Schmorl, world-famous as an expert on the pathology of the spine; and Christeller, a leader of a modern school of thought who unfortunately died at an early age. Schmorl stood for the first point of view, Christeller for the second, and Pommer for the third. All three used the same histological techniques, and they did not differ in the description of what they actually saw under the microscope. How then was it possible for them to arrive at so entirely different conclusions? This is not an isolated example: it is rather a test case, indicating one point in which lack of insight into the natural limits of one special sphere of research had led to a paradoxical situation.

What are these limits? Has not histology, like all the new spheres of our search for facts—radiology as well as biochemistry, bacteriology not less than applied physics—gone from success to success since the times when Virchow built the foundations of medical morphology? How dare one talk of limits of a line of research which is still very active in conquering new land?

What the three experts on bone histology saw through their microscopes was that fibrous tissue of a certain type had replaced bone tissues; that was beyond dispute. But there were differences as to the amount and the localisation of this replacement, and its combination with other changes. They saw many slides of the same part of one bone, of other parts of the same bone, of many parts of many bones of the same case, and they compared all this with the same vast material from another case. In the course of many years they saw many such cases. Their minds started grouping what they saw according to analogies and differences, and, unknown to themselves, this mental process of grouping superseded all other considerations. Instead of some facts from outside histology influencing this formation of groups in their minds, opinion once formed became conviction, conviction became "fact." After having spent half a life time on acquiring what was essential in the way of experience, they took what they saw not merely for a sector of medical knowledge, but for the whole of it. They accepted histology as the branch of research capable of leading to the identification of disease.

At last Schmorl's conception was proved to be the right one, but was it proved because of histological facts? Certainly not. The discovery that osteitis fibrosa was always connected with a pathological condition of the parathyroids while Paget's disease was not decided the matter. Once more clinical observation, surgical enterprise, and some suspicions rather than facts arising from earlier findings provided the clue to the solution of a problem on which no special line of research had spent more efforts than histology.

A new controversy arose over the question whether this "tumour" of the parathyroids was the cause or the consequence of the disturbance of metabolism of which the bone-changes are only one symptom. Again histology tried her hand at deciding this matter from what the microscope revealed. But, although the question is still without a conclusive answer, this much can be said, that it is not to histology that we have to look for the last word.

VALUE OF PATHOLOGICAL EVIDENCE

In this country there exists a characteristic reluctance to rely too much on the more static findings of morphology as opposed to the more dynamic ones of clinical and physiological observation. But on the Continent and in the United States the tendency to make use of histological findings for the solution of problems beyond their reach is still to be found. On the other hand, those who observed the inadequate result of so much work have sometimes gone to the other extreme of doubting the value of histological evidence even where it was the best guide.

How can the limits of pathological histology be defined? One can state that histology alone is unable to provide sufficient evidence for or against the identification of diseases. Experience goes far to prove that these limits are real. But are they permanent, or will it be possible for histology in the course of its future development to overcome them? If they were drawn only by technical difficulties, or due to the fact that the opportunities offered by histology are by no means exhausted, we would have to admit this possibility. But the reasons for the limitation are to be found in the very nature of the material that forms the subject of histology. What we can see on a slide are the responses of cells and tissues to ætiological factors. The number of these factors is almost unlimited, but the variety of responses is not. The number of different changes a cell or a tissue can undergo is very small indeed. And further, each kind of cell or tissue has to rely on its own specific and limited choice of responses to the great variety of factors able to provoke a response.

This in short is the law governing the visible effects which form the subject of histology. It is this law of the restricted variety of responses which sets the

real and permanent limits to its scope. We find a parallel to it in the law of specific physiological responses of the organs of sense, formulated about a hundred years ago by Johannes von Mueller. He stated that the response of the eye, for example, was and had to be always a visual one independent of the kind of stimulus which acted on it. Just as it is thus impossible to infer from the physiological response of the eye the nature of the stimulus provoking it, it is impossible to draw from the morphological responses of less highly specialised cells definite conclusions as to their causes.

The relation between the variety of ætiological factors and the comparatively poor variability of cell and tissue-reactions might be compared to the relation between our emotions and our facial expression of them. We can all diagnose joy, anger, fear, or sorrow on each other's faces. But in order to know the reasons which occasion them we have to know a good deal about both the character of the person and the special circumstances leading to the emotion. It might be argued that not much is gained by the knowledge of this law. But in our test case, would it not have been impossible for such an extended argument between three leading pathologists to arise at all, involving as it did an enormous amount of work and thought, had the existence of this law been recognised? The knowledge that bone tissue is particularly limited in its variety of responses ought to have made it clear from the outset that it was useless to try to make the presence, amount, or features of fibrous tissue in bone the basis of conclusions for or against the identity of bone diseases. We said that this test case was not an isolated one. We need only mention the controversy raging for years between two other continental pathologists over the causation of gastritis and gastric ulcer. Each one tried to prove his case with arguments based on histological findings. It was another example of great efforts futile from the very start because of ignorance of the limiting law. I hope to have shown that this law applies to pathological histology as a whole. But histology is only one of the many auxiliary forces of research, the one in fact in which I have some experience. I venture to think that other spheres of isolated research might suffer from similar uncertainties as to the limits of their real scope, and that an effort should be made to eliminate them. Knowledge of its limits should prove as valuable in every field as knowledge of its possibilities. Pathological histology, by confining itself to its limits, will gain more than it might lose. Confidence in its achievements will grow in proportion as the histologist leaves the water-tight compartment into which some enthusiastic workers retired in order to accomplish independently the highest feats of research. Alone it will be in danger of being led ad absurdum; as a member of the corporate team of medical sciences it will give further proof that it is indispensable.

SUMMARY

The number of possible causes of disease and their combinations is far greater than the number of different responses at the disposal of the tissues. The histologist can describe the responses but he cannot with certainty draw conclusions as to their causes from this examination alone. Workers in all branches of scientific research would be saved much wasted effort if the limitations of specialised studies were more clearly defined and more fully realised.

We are asked by British Cellophane Ltd. to observe that the word Cellophane is their registered trade mark.

DRINK

Commissioner David Lamb, who is in charge of the intelligence department of the Salvation Army, on Jan. 10 addressed a meeting of the Society for the Study of Inebriety, held in London. The total number of convictions for drunkenness in England and Wales in 1936, he said, was 44,500, and this represented an increase of over 5 per cent. on the previous year. In 1913, however, the number of convictions was nearly 189,000, equal to 48 per 10,000 of population, whereas the corresponding 1936 figure was 11. Of the convictions in 1936, 38,000 related to males and only 6500 to females, and this was the more remarkable since the female population exceeded the male by 2 million. He was inclined to think that the female was on the whole more faithful than the male, and that a finer loyalty to their ideals kept them on the straight and narrow way. In his early days it used to be generally accepted that a drunken man could be saved, but seldom, if ever, a drunken woman. The Salvation Army's experience in all parts of the world had given the lie to that notion. It had also shown them how close was the alliance between drink and prostitution; without the stimulus of alcohol there would be an immense falling-off in the demand for loose women and brothels, and without drink inside such establishments "business" would languish.

During the period 1883–1937 the number of public-houses in England and Wales had decreased by 27 per cent.; the number of standard barrels of beer consumed by 42 per cent.; the number of gallons of spirits consumed by 70 per cent., and convictions for drunkenness by over 75 per cent.—from 174,000 to 44,000. Aggregate expenditure on drink had remained high, however, and the average proportion of income spent on drink was about the same as before the war. Apart from the direct effect on industrial production, and therefore on the standard of life, the yearly cost of crime caused by drink, and of poverty due to drink, was estimated at nearly £50 million, and if some of it were capitalised the national asset would probably be £1000 million in a generation. Drink was, in the last analysis, antisocial, and, social as drinking might be, it lay at the root of nine-tenths of poverty, squalor, vice, and crime. At the same time it had to be recognised that the gin-palaces and beer-houses, like many other evils, were largely a natural outgrowth of social conditions. The Salvation Army believed that salvation was a sovereign remedy; that the expulsive power of a new affection worked wonders. But they did not know, for example, why in one case the craving for drink seemed to disappear on what they called conversion, while in another case, where the spiritual desires appeared equally sincere and the renunciation as whole-hearted, the person had to continue to fight the craving.

The Salvation Army considered suitable work, and plenty of it, as the cure, humanly speaking, for all ills, whether physical or economic; change of environment and treatment—chiefly of diet—were also found effective. Commissioner Lamb's experience in charge of the Army's land and industrial colony at Hadleigh, Essex, where most of the thousands of cases coming under his care and observation had been directly or indirectly attributable to drink, taught two outstanding lessons, apart from proving the supreme health-giving and health-restoring qualities of digging the soil. The first was that drink is a secondary cause in social downfall, where it has often been regarded as a primary cause. An investigation of 800 cases showed that 60 per cent. originally classified as "drink cases" might have been more correctly defined as "social" since the originating cause lay in domestic troubles and business worries. The second lesson was to regard the public-house as a possible means of grace, because the men have to learn to resist the temptation to go for a drink.

At the centres for inebriates the wholesome effect of the right environment was noticeable—regular occupa-

tion, suitable fellowship lectures, meetings, and recreative gatherings. Treatment should not be such that a man was never subjected to temptation. A test of the work done in six years at the Salvation Army's island settlement in Sweden, which had accommodation for 56 male patients, showed that 60 per cent. definitely benefited and 39 per cent. were cured. Diet everywhere was mainly fruitarian and vegetarian. Drink was stopped at once; there was no weaning. Women inebriates and drug-addicts had to have a milk diet, and those bordering on delirium tremens were generally kept on lemon juice and soda. They were given a blanket-bath and sponged with hot water in which a little vinegar was placed; they had small mustard packs applied to the base of the spine and the back of the neck, and their feet were placed in hot mustard-and-water, with a cool bandage on the head.

In conclusion Commissioner Lamb said that the cause of temperance and total abstinence was undoubtedly making progress, and in the poorer areas gambling and betting were now probably greater curses than drink.

In the discussion which followed Mr. W. McAdam Eccles urged the importance of preventive measures by teaching children in their homes and at their schools. A vast amount of harm was done by what was called "moderate drinking." Road accidents, injuries, and fatalities would be halved if moderate drinking was stopped by drivers and pedestrians.

Sir Robert Armstrong-Jones spoke of the difficulty of reconstructing, remaking, and reconditioning the drunkard, and mentioned that for some years he had as patient a woman who had more convictions for drunkenness (265) than any other woman in the Victorian era. He did not think that poverty was the cause of drunkenness or drinking. If religion could be taught more in the schools and homes there would be far less drinking.

THE GRADING OF NURSES

THE first report of the Interdepartmental Committee on Nursing is expected this month and the various interests concerned are alert to receive and examine new proposals. The issue of a short book [1] by "the mouthpiece of a group of nurses," setting out ideas for a radical reorganisation of professional training and conditions of employment, is therefore well timed. A crisp title and a meaty extract from the preface quoted on the dust-cover stimulate an appetite which is not fully satisfied by the text. Too much space is given to a recapitulation of familiar facts in the history of nursing, at the expense of argument on ways of grafting the suggested reforms on existing practice. For example, the classification of patients in hospitals according to their needs of nursing services would be no easy task, since these needs must fluctuate with progress towards or away from good health. The services required are differentiated into sets of duties which, according to Miss Carter, could be spread among four different types of workers, only two of which need be nurses: (1) highly skilled nursing of patients acutely ill; (2) simple nursing procedures for chronic or convalescent patients; (3) duties such as those performed by orderlies in military and naval hospitals; (4) purely domestic work. The "new deal" is essentially the replacement of the existing general and subsidiary state registers by two only, for the enrolment of grade A and grade B nurses who would respectively undertake duties (1) and (2) in this classification. Some other proposals are that unregistered persons should be prohibited from the practice of nursing "habitually and for gain." Nurses' coöperations, which should be licensed, should be bound to inform each employer of the status (A or B) of the nurses sent out, and a salaried domiciliary service of nurses should be set up on terms that do not undercut private work. Nursing schools should be graded and (rather surprisingly) some hospitals recognised for the training of both A and B nurses, being staffed also by members of both grades.

After a rather superficial exposition of these and other ideas Miss Carter comments again on the traditional methods of training, and the psychological and financial obstacles to reform. She criticises present conditions and the disunity in the profession which prevents common action to amend them. She urges the need for the establishment of at least one subsidised experimental training school, associated with a group of hospitals not dependent on student labour and with the local public health department. She pleads for self-government of the profession, but visualises the ultimate replacement of the General Nursing Council by a Whitley council, representative of all kinds of nurses and of the employers and consumers of nursing services.

There is no lack of constructive suggestions in this book, though some of them may be unacceptable to the parties concerned and not easily workable in practice.

[1] A New Deal for Nurses. By G. B. Carter, B.Sc., S.R.N., S.C.M., formerly supervising sister, outpatient midwifery, University College Hospital; lately organising secretary to the Midwives Institute. London: Victor Gollancz. 1939. Pp. 319. 5s.

THE DRUG CALL

AT a meeting of the council of the Institute of Applied Pharmaceutics on Jan. 13 Dr. F. W. Crossley-Holland, junior counsel to the institute, spoke of the increasing unwillingness of medical practitioners to grant interviews to pharmaceutical representatives. This was, he suggested, due to the greater number and the inferior types of visitor; and so effective has been the refusal that the mounting cost of successful interviews has dissuaded several firms from using the personal call as a method of propaganda. Yet, in Dr. Crossley-Holland's view, personal contact forms the ideal means of propaganda where the appeal of ethical products is concerned, granted ability on the part of the representative to discuss things in an intelligent and knowledgeable manner. There should be some easy and certain means of enabling the doctor to differentiate between caller and caller, and this, he said, was exactly what the machinery of the institute might ensure. Its membership would be a passport to the presence of medical men. Later, he hoped, holders of the institute's qualification would gain admission to the Register of Medical Auxiliaries.

MENTAL DISEASE EXPLAINED

To persuade people out of the old prejudices about mental disorder and its treatment is one of the most important functions of mental hygiene propaganda. These prejudices centre in the "stigma" of being certified as insane, and the supposed incurability of mental illness. Straightforward explanation of the real state of affairs can do much to kill these chimeras. It is true that they may be irrational beliefs which cannot be wholly corrected by evidence, however forcible: but even though this may sometimes be the case, there can be no doubt as to the efficacy of honest statements about the similarity of mental to other forms of illness, the need for early treatment, and the advantages of skilled care in a mental hospital, whether public or private. Such matters are simply and clearly expounded in a brochure by Dr. Horace Hill (The Public Attitude towards Mental Disease, and Urgent Reasons for Early Treatment. Salisbury. 1938. Pp. 36. 1s. 6d.). In appropriately simple form he restates for the public those general and practical issues which are concerned in ensuring adequate treatment for any relative who may become mentally ill.

VITAMIN-B COMPLEX: CORRIGENDUM.—In our report last week of a meeting of the Royal Society of Medicine's section of pharmacology and therapeutics the remarks made by Dr. C. C. Ungley were wrongly attributed to his brother, Mr. H. G. Ungley. We also regret that, by an inadvertence for which our reporter was in no way responsible, a number of copies of THE LANCET gave the name of the last speaker incorrectly.